

Examining Sport Commitment and Intentions to Participate in Intramural Sports: Application of the Sport Commitment Model and the Theory of Planned Behaviour in a Campus Recreational Sport Setting

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Abstract

Fifty-six percent of Canadians, 20 years of age and older, are inactive (Canadian Community Health Survey, 2000/2001). Research has indicated that one of the most dramatic declines in population physical activity occurs between adolescence and young adulthood (Melina, 2001; Stephens, Jacobs, & White, 1985), a time when individuals this age are entering or attending college or university. Colleges and universities have generally been seen as environments where physical activity and sport can be promoted and accommodated as a result of the available resources and facilities (Archer, Probert, & Gagne, 1987; Suminski, Petosa, Utter, & Zhang, 2002). Intramural sports, one of the most common campus recreational sports options available for post-secondary students, enable students to participate in activities that are suited for different levels of ability and interest (Lewis, Jones, Lamke, & Dunn, 1998). While intramural sports can positively affect the physical activity levels and sport participation rates of post-secondary students, their true value lies in their ability to encourage sport participation after school ends and during the post-school lives of graduates (Forrester, Ross, Geary, & Hall, 2007).

This study used the Sport Commitment Model (Scanlan et al., 1993a) and the Theory of Planned Behaviour (Ajzen, 1991) with post secondary intramural volleyball participants in an effort to examine students' commitment to intramural sport and intentions to participate in intramural sports. More specifically, the research objectives of this study were to: (1.) test the Sport Commitment Model with a sample of post-secondary intramural sport participants (2.) determine the utility of the sixth construct, social support, in explaining the sport commitment of post-secondary intramural sport participants; (3.) determine if there are any significant differences in the six constructs of

the SCM and sport commitment between: gender, level of competition (competitive A vs. B), and number of different intramural sports played; (4.) determine if there are any significant differences between sport commitment levels and constructs from the Theory of Planned Behaviour (attitudes, subjective norms, perceived behavioural control, and intentions); (5.) determine the relationship between sport commitment and intention to continue participation in intramural volleyball, continue participating in intramurals and continuing participating in sport and physical activity after graduation; and (6.) determine if the level of sport commitment changes the relationship between the constructs from the Theory of Planned Behaviour.

Of the 318 surveys distributed, there were 302 participants who completed a usable survey from the sample of post-secondary intramural sport participants. There was a fairly even split of males and females; the average age of the students was twenty-one; 90% were undergraduate students; for approximately 25% of the students, volleyball was the only intramural sport they participated in at Brock and most were part of the volleyball competitive B division. Based on the post-secondary students responses, there are indications of intent to continue participation in sport and physical activity. The participation of the students is predominantly influenced by subjective norms, high sport commitment, and high sport enjoyment. This implies students expect, intend and want to participate in intramurals in the future, they are very dedicated to playing on an intramural team and would be willing to do a lot to keep playing and students want to participate when they perceive their pursuits as enjoyable and fun, and it makes them happy. These are key areas that should be targeted and pursued by sport practitioners.

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Chapter One

Introduction

The World Health Organization has identified obesity as a global epidemic that is evident not only in western countries such as Canada, the United States, the United Kingdom, Australia, Sweden, and Germany, but also in countries such as Brazil, China and Israel (Le Petit & Berthelot, 2005). In 2004 “approximately 6.8 million Canadian adults age 20 to 64 were overweight, and an additional 4.5 million were obese” (Starky, 2005, p. 2). Over the past two decades the prevalence of obesity has more than doubled in Canada (Le Petit & Berthelot). In 2005 a study conducted by Canadian Community Health showed almost half of all Canadians (48%) aged 12 and older were inactive during their leisure time, meaning they did less than half an hour of walking each day.

Engaging in regular physical activity has well documented benefits; unfortunately there are less than optimal participation rates (U. S. Department of Health and Human Services, 1996). Specifically, over half of Canadian teenagers are sedentary and those aged 15 to 19 are more likely to be sedentary than those aged 12 to 14 (Craig & Cameron, 2004). Canadian adults are not leading healthy lives either, as 56% of Canadians (20 and older) are inactive according to the 2000/01 Canadian Community Health Survey. Sedentary behaviours continue to rise as research has found that as age increases, adults are less likely to be active (Craig & Cameron). In Ontario, 49% of adults are at least moderately active during their leisure time (Canadian Fitness and Lifestyle Research Institution [CFLRI], 2004).

Physical inactivity is a critical public health issue for Canadians as regular physical activity can help prevent chronic conditions, some cancers, coronary heart

disease, osteoporosis, anxiety and depression, and physical activity can improve functional ability with age (Craig & Cameron, 2004; Pate et al., 1995). The rising level of obesity and the associated health concerns are creating an economic burden on the Canadian healthcare system (Starky, 2005); this makes physical activity programs essential as a preventative measure. In Canada, the demographics of people least likely to be active are older teenagers, adults who do not work (other than retired individuals), and adults with lower incomes (CFLRI, 2004). Health behaviours (e.g., physical activity) during childhood, adolescence, and young adulthood can determine one's quality of life in later adulthood (Buckworth, 2001). This demonstrates the importance of staying active across the lifespan.

Research has indicated that one of the most dramatic declines in population physical activity occurs between adolescence and young adulthood (Malina, 2001; Stephens, Jacobs, & White, 1985). The transition to university life is a process marked by a variety of significant change. University life creates a shift in routine and habits in environments that were previously secure and predictable in which there was a sense of control (Bray & Born, 2004). All this change is associated with a shift in lifestyle choices including physical activity and participation rates. As a result, lack of physical activity is a significant health problem in the college population (Kilpatrick, Hebert & Bartholomew, 2005).

Research has found that regular physical activity significantly drops off from high school to university and that almost half of all college students report an additional decrease in physical activity after graduation (Kilpatrick et al., 2005). Colleges and universities have generally been seen as environments where physical activity and sport

can be promoted and accommodated as a result of the available resources and facilities (Archer, Probert, & Gagne, 1987; Suminski, Petosa, Utter, & Zhang, 2002). Post-secondary campus recreational sports programs, one of the primary on-campus physical activity outlets for students, are uniquely positioned to provide a broad variety of sport opportunities. One of the more common campus recreational sports options available for university students is the intramural program. Intramural sports provide opportunities for all students with a variety of rule modifications to meet the particular needs and interests of the students (Ross, 2006). Intramural programs enable students to participate in activities that are suited for different levels of ability and interest (Lewis, Jones, Lamke, & Dunn, 1998). Elite and varsity athletes have other sports programs tailored for them, where intramural programs are flexible and offer variety for the larger student body.

The more students are involved in recreational sports (RS) throughout their time at school the more importance they place on sports and fitness activities after graduation (SFAAG) (Forrester, Arteberry & Barcelona, 2006). However, the breadth and depth of RS participation only explains 15.1 % of the variance in importance of SFAAG. The authors further implied that the importance of SFAAG for students was an indicator of continued participation in sport and fitness activities. However, a better measure of the likelihood of continuing participation is a student's commitment to sport. Sport commitment is defined as "the psychological state representing the desire or resolve to continue sport participation" (Scanlan, Carpenter, Schmidt, Simons, & Keeler, 1993a, p. 1). When an individual has a strong sense of commitment, it reflects either wanting to or having to continue in a sport. Individual commitment is dependent upon the level of participation targeted and can be expected to vary widely (Scanlan et al., 1993a). For

example, an individual may be committed to playing soccer but not committed to all soccer programs. The model of sport commitment states that sport commitment is “determined by sport enjoyment, involvement alternatives, personal investments, social constraints, and involvement opportunities” (Scanlan et al., 1993a, p. 1). Sport commitment examines the motivation to persist in organized sports “encompassing the full range of competitive contexts from recreational to elite” (Scanlan et al., p. 2, 1993a). In studies where the relationship between sport commitment and social support have been examined (Carpenter, 1992; Carpenter & Coleman, 1998; Scanlan et al., 2003; M. R. Weiss, Kimmel & Smith, 2001), social support has emerged as an additional determinant of the model. Social support, defined as “the support and encouragement the athlete perceives significant others provide for their involvement in sport” (Carpenter, 1993, p. 59) and is unconditional encouragement and positive regard (Weiss & Weiss, 2003) and is the degree of perceived support received from other people for participating (Wilson, Rodgers, Carpenter, Hall, Hardy, & Fraser, 2004). Social support has received attention in the literature and it is appropriate to incorporate social support as a construct in this study. Wilson et al. did research in the area of commitment with post-secondary students and their exercise behaviour and the study included social support as a determinant in the SCM. While this study used the same demographic, the current data was collected from the intramural environment. This study can be added to the limited literature on social support. Another reason social support was used in the study is because of the social benefits derived from being a part of the intramural environment.

Sport commitment represents a psychological state rather than the actual behaviour of staying in or leaving an activity (Scanlan et al., 1993a). Ultimately,

psychological commitment should predict behavioural commitment in areas such as effort and persistence (Weiss & Weiss, 2007). The SCM assumes that the psychological attachment an individual has to their sport participation plays a significant role in determining their persistence and continued involvement, however, the actual behaviour of staying in the activity is not measured. Therefore, it is also important to examine an individual's intentions to continue participating in intramurals, sport, and physical activity, the best predictor of future behaviour according to the Theory of Planned Behaviour (TPB) (Ajzen, 1988, 1991) which has been used to understand and predict numerous health behaviours. According to the theory, intent is the most important determinant of a person's behaviour, as intent is a direct determinant of actual health behaviour (Rhodes & Plotnikoff, 2006). By using both the Sport Commitment Model and the TPB, we can develop a better understanding of the relationship between sport commitment and intent to continue participating in intramurals now and in the future, and also determine if sport commitment is a moderating variable in the TPB.

Statement of the Problem

According to a study done by the Canadian Fitness and Lifestyle Research Institute (CFLRI) older teenagers are less likely to be active (2004). As this is a time when levels of physical activity drop off, it is useful to determine what keeps post-secondary students committed to their sport pursuits. The negative health outcomes of a sedentary lifestyle have been widely acknowledged and likewise, never before have so many studies addressed the many positive aspects surrounding the health benefits of activity and fitness (Sharkey & Gaskill, 2007). It would be useful to understand which, if any, of the constructs of sport commitment keep post-secondary students involved in

physical activity and sport, including sport enjoyment, involvement alternatives, personal investments, social constraints, involvement opportunities and finally, social support. Intramural programs and “access to school physical activity facilities outside of school hours can provide opportunities for health-enhancing physical activity” (Wechsler, Devereaux, Davis & Collins, 2000, p. S121). The results of this study will identify the constructs that most influence students’ desire or resolve to continue participation in sport. The constructs of the SCM do not assess the physical aspect of participation, but focus more on the psychological perspective of student involvement and commitment. With that information university intramural administrators can better market and tailor the programs to the students in an attempt to facilitate continued intramural sport participation, maintain an active lifestyle and increase the favourable health benefits associated with regular physical activity.

Purpose of the Study

The purpose of this study was to determine whether the Sport Commitment Model is applicable across different populations and sports contexts (e.g., recreational sports/intramurals) and if the additional construct of social support is applicable and useful in the intramural environment. This study contributed to the limited body of knowledge on post-secondary participation in intramural sports; specifically in relation to sport commitment as the SCM has not been used in the area of intramurals at the college or university level. The results of this study will help in developing a better understanding of what determinants students’ value most and what keeps them committed to physical activity and sport. Also, the Sport Commitment Model is early in development as it has been around for less than twenty years. More research is needed to support whether the

model is reliable and consistent across different populations and sport participation categories (i.e., intramurals) and if the additional construct of social support is applicable and useful in the intramural environment. Social support has been examined with post-secondary students in the exercise domain (Wilson et al., 2004) but not in the intramural domain. Literature highlighting the benefits of intramural participation as identified by post secondary students recognizes social benefits as a consistent theme (Kanter & Forrester, 1997; Kimball & Freysinger, 2003; Artinger et al., 2006). Social support is new to the sport commitment literature and warrants further testing. The Theory of Planned Behaviour has been included in addition to the SCM to examine future intentions to participate in intramurals or sport in general. The TPB will also be used to determine if sport commitment is a moderating variable in explaining intentions for future behaviour.

Significance of the Study

Scanlan, et al. (1993) developed the Sport Commitment Model in a study where the subjects were children ranging in age from 10 to 19 years. Since it was developed, the model has been used in research with both children and adults. The model does not account for cognitive and social development and it is expected that the “antecedents of commitment” should vary with development (Crocker, Hoar, McDonough, Kowalski, & Neifer, 2004). Children tend to rely on parents and other significant adults for support whereas adolescents are more closely tied to peer support and approval. Crocker et al. concluded that “more research is needed to examine the structure of sport enjoyment and sport commitment at different developmental stages” (p. 213). While the Sport Commitment Model has been used in the post-secondary setting with university students enrolled in group-based exercise classes (Wilson et al., 2004), it has not been used in the

intramural sport environment that includes recreational participants at varying levels of competition. Studying sport commitment at the post-secondary level is important as it is an important time in life to establish healthy habits that can carry over into adulthood.

Delimitations

Subjects in this study were students at Brock University in St. Catharines, Ontario. The participants were both male and female students enrolled at the university. The study was delimited to students currently participating in intramural volleyball but will also investigate which other intramural sports subjects participate in. Approximately 300 surveys were collected, as last year there were over 700 participants in the volleyball program.

Limitations

The survey itself was a limitation based on how the questions are structured. For example, closed ended questions were used and participants' responses may not "fit" into a suitable category as presented in the Likert scale. The use of participants from only one post-secondary school, and surveying only those individuals who participate in intramural volleyball, potentially reduces the generalizability of the results outside of intramural volleyball and the university.

Assumptions

The basic assumption of the study is that the students who volunteer to participate in the study will be able to understand the questionnaire and answer it honestly. Another primary assumption, based on the literature, was that Scanlan et al. (1993a) created a model that accurately evaluates sport commitment and was applicable to this study. Another assumption of the study was that using a survey would be the best way to get

access to the information as the Sport Commitment model focuses on an athlete's psychological attachment to participation rather than the actual behaviour (Guest, 1998) which is better evaluated with personal reflection and cannot be determined with simple observations.

Research Objectives:

The research objectives of this study are to:

- 1.) Test the Sport Commitment Model with a sample of post-secondary intramural sport participants;
- 2.) Determine the utility of the sixth construct, social support, in explaining the sport commitment of post-secondary intramural sport participants;
- 3.) i.) Determine if there are any significant differences in the six constructs of the SCM and sport commitment between: gender, level of competition (competitive A vs. B), and number of different intramural sports played;
 ii.) Determine if there is a significant interaction effect between gender and level of competition for the six constructs of the SCM and sport commitment;
- 4.) Determine if there are any significant differences between sport commitment levels and constructs from the Theory of Planned Behaviour (attitudes, subjective norms, perceived behavioural control, and intentions);
- 5.) Determine the relationship between sport commitment and intention to: (i) continue participating in intramural volleyball, (ii) continue participating in intramurals, and (iii) continue participating in intramurals and other sports and physical activities after graduation;

- 6.) Determine if the level of sport commitment changes the relationship between the constructs from the Theory of Planned Behaviour.

Definition of Terms

Campus Recreation. – Campus recreation exists for reasons to align itself with the mission of the university, which is to enhance students' quality of life and prepare students for the future (Weese, 1997). Also campus recreation was found to promote school spirit and feelings of affiliation with other students and the university (Weese, 1997). Campus recreation also provides students with opportunities to participate and compete in a variety of sports (Kanters & Forrester, 1997).

Intramural Sports. – “The word 'intramural' is a combination of the Latin words intra meaning 'within' and muralis meaning 'wall'. When used as an adjective with the term sport, it refers to sport events for members confined within the walls or jurisdiction of a setting. Intramural sport represents structured sport participation, which requires design and leadership for its provision" (Mull, Bayless, Ross, & Jamieson, 1997, p. 94). Provides competitive and recreational opportunities for all students of varying skills and abilities to participate in sports, where varsity sports only support “elite” athletes (Lewis, Jones, Lamke & Dunn, 1998). In a specific setting, such as a university campus, intramural sports are “structured activities between teams and individuals within an agency's limits or boundaries” and the opportunities are provided for men, women and mixed competition to meet the needs of the participants (Ross, 2006, p. 274).

Resick, Seidel, and Mason (1979) defined intramurals as follows:

Intramurals is a term which in modern usage designates the entire spectrum of the program whose offerings range from tournaments in basketball, badminton,

bridge, chess, and other activities to interest clubs in such diversified activities as dance, weight-lifting and SCUBA. “Intramural” literally means “within the walls” and this meaning still applies. In other words, an intramural program is one that is carried on within the confines of a school or institution.

Chronologically, the term applied to the entire program has gone from “intramural athletics” to “intramural sports” to “intramural activities” to the present somewhat standard, all-inclusive “intramurals (p.93).

Sport Commitment. – Is a psychological state representing the desire and resolve to continue sport participation in a particular program, a specific sport (e.g., soccer), or sport participation in general. There are five direct influences that can increase or decrease sport commitment: sport enjoyment, involvement alternatives, social constraints, personal investment, and involvement opportunities (Scanlan, et al., 1993), and for the purpose of this study, the additional sixth construct of social support.

Definitions of each construct in the SCM (Scanlan et al., 1993):

- 1.) Sport Enjoyment. – It is a positive affective response to the sport experience that reflects generalized feelings such as pleasure, liking, and fun. It is considered an attractive variable and an important motivator in sport.
- 2.) Involvement Alternatives. – Is the attractiveness of the most preferred alternative(s) to continued participation in the current endeavour. Having more attractive alternatives is predicted to lower sport commitment.
- 3.) Social Constraints. – Are social expectations or norms which create feelings of obligation to remain in the activity; the sense of social pressure to participate.

- 4.) Personal Investments. – Are personal resources that are put into the activity which cannot be recovered if participation is discontinued. These things include time, effort, and money.
- 5.) Involvement Opportunities. – Are valued opportunities that are present only through continued involvement; it is based on the anticipation of what would be missed by discontinuing participation.
- 6.) Social Support. – Is defined as “the support and encouragement the athlete perceives significant others provide for their involvement in sport” (Carpenter, 1993, p. 59).

Theory of Planned Behaviour. – The intent to perform different behaviours can be predicted by attitudes towards the behaviour, subjective norms, and perceived behavioural control. Intentions are an indication of an individual’s readiness to perform a specific behavior. Intentions along with behavioural control account for considerable variance in actual behaviour (Ajzen, 1991).

Chapter Two

Literature Review

Guided by Scanlan, Carpenter, Schmidt, Simons, and Keeler's (1993) Sport Commitment Model, the intent of this study was to examine post-secondary students' commitment to sport based on their intramural participation. It is important to know and understand the benefits and motives for student participation to promote lifelong physical activity pursuits. Each of the following will be discussed in an attempt to develop the necessary background for this study: (A.) The Benefits Movement (a time line to understand the progression of change), (B.) Benefits of Recreational Sports and Intramurals in Post-Secondary Schools including; Physical Activity, Academic, College Satisfaction, Self-esteem, and Stress, (C.) Participation Patterns Across the Lifespan, and (D.) Relevant Theories and Models including; the Sport Commitment Model (SCM) and the Theory of Planned Behaviour (TPB).

The Benefits Movement

For the last 15 to 20 years there has been a dramatic change in the perception and variety of benefits individuals can experience while engaged in recreation and leisure pursuits. The term benefit can be thought of as a "desirable change of state; it is a specified improvement in the condition or state of an individual or a group of individuals . . . a benefit means a gain of some type" (Schreyer & Driver, 1989, p. 388). Schreyer and Driver observed that leisure was beneficial but obtaining precise knowledge about the extent of those benefits was difficult. At that time, Schreyer and Driver noted that researchers had not scientifically documented the nature of the benefits of leisure enough

to influence public policy, and as a result the field did not receive enough recognition or allocation of resources.

One of the primary reasons for establishing more background knowledge on the benefits of leisure is to advance and promote the leisure profession. As Schreyer and Driver (1989) pointed out, “the most telling characteristic of a profession is its empirically supported body of knowledge” (p. 399). Adding to the body of knowledge surrounding leisure would advance understanding, add to existing models and theories, and create new ones. Another reason to advance the literature on leisure benefits is to improve resource allocation decisions. Once basic public resources have been allocated “information on benefits would improve the ability of recreation planners and managers to define clear objectives and prescriptions and, then to establish more explicit standards and guidelines for meeting those objectives” (Schreyer & Driver, p. 400). Finally, Schreyer and Driver noted that enhancing consumer choice would be positively influenced with the improvement of research on the benefits of recreation. If individuals are aware of the benefits of their chosen leisure pursuits they “might value them more highly, engage in them more often, and be more willing to pay for those opportunities” (Schreyer & Driver, p. 402).

Since the call by Schreyer and Driver (1989), many researchers in the field have documented a variety of benefits that can be derived from recreation and leisure pursuits. Driver, Brown, and Peterson (1991) compiled research that had been done to date on the benefits of leisure into one book. The idea of the book was a catalogue of the benefits of leisure and a complete assessment of how well these benefits have or have not been documented through research (Mannell & Stynes, 1991, as cited in Driver et al.). The

authors divided benefits into physiological, psychological, social, economic, and environmental. The text also discussed how leisure positively influences family bonding, communities, and individuals with disabilities. While this work illustrated that the field had advanced, it also clarified that more research was necessary.

With the expanded body of knowledge surrounding the benefits of leisure, modern approaches were incorporated in order to use this new understanding to advance the field. The Benefits Approach to Leisure (BAL) was developed and is recognized as a “paradigm shift in the way we conceive of and manage recreation resources and programs” (Driver & Bruns, 1999, p. 439). The BAL was created as a way of promoting and applying the benefits literature to the delivery of leisure services (Driver, 1998). The primary consideration of the BAL is to assess why a particular leisure service should be provided and “the answer is formulated in terms of clearly defined positive and negative consequences of delivering that service, with the objective being to optimize net benefits – or to add as much value as possible” (Driver & Bruns, 1999, p. 350). This allows leisure service providers the opportunity to apply the results of benefits research to their program. Leisure is a leading economic sector (Driver & Bruns) and an important social service sector; however, the benefits of leisure are often not recognized or appreciated, making it essential for leisure providers to promote the benefits of their programs (Driver & Bruns).

Today, the BAL is used by leisure scientists, educators, policy makers, and managers. It is important for all individuals in the field to be aware of the benefits and promote them as recreation and leisure is a field that lacks support from federal policy and is rarely recognized as a significant business and social service (Driver & Burns,

1999). The benefits of leisure are not recognized and appreciated, putting more responsibility on the individuals in the recreation and leisure service profession to advertise and promote the benefits. Driver (1998) acknowledged that “unless each of us [in the field] promotes and articulates the benefits of leisure, the tremendous value that parks and recreation adds to human welfare will never be recognized and appreciated fully outside the leisure profession” (p. 26). The benefits need to be clearly articulated and relayed to communities.

The benefits movement recognizes the relationship between holistic well-being and the recreation profession (O’Sullivan, 2001). To create awareness of the benefits to those who do not work in the profession, recreation programs need to create awareness of the benefits. Recreation programs also need to change so they will be viewed as essential. The changes need to target a constantly changing population and follow trends with updated approaches and strategies. Recreation programs need to reposition themselves to align with changing trends such as childhood obesity, an aging population, and large numbers of immigrants (O’Sullivan). While recreation practitioners recognize the benefits of recreation programs these benefits need to be identified the same way by the general population.

The National Park and Recreation Association (NPRA) has been very influential in advancing and promoting the BAL. As part of the Benefits Movement, NRPA has addressed three components including Benefits-Based Awareness (BBA). BBA is a promotional effort “designed to increase internal and external awareness of the ‘benefits’ of park and recreation-related experiences in regard to quality-of-life determinants” (NRPA, 1998, p. 28). The second component is Benefits-Based Program (BBP). BBP is

the delivery of programs using the ‘benefits’ and creating an evaluation process with measurable goals and objectives “in an effort to validate specific individual, social, economic, and environmental attributes” (NRPA, p. 28). The final component, and most well recognized, is Benefits-based Management (BBM) which “involves defining explicit target benefits (outcomes) which may lead to beneficial consequences for either the participants and/or society” (Allen, 1996, p. 65). With BBM, management efficiency and effectiveness are not the primary goals, but are key components in providing valuable services and programs (Allen). The emphasis is on the quality, structure, and content of the leisure opportunities themselves (Allen).

Our understanding of the benefits of recreation and leisure is expanding through research that has increased the body of literature on this topic. The important measures that now need to be pursued involve using this information in a form that best serves to benefit participants. As more research is conducted, there are more opportunities to gain a deeper understanding regarding the benefits of leisure. This allows for a more detailed approach to specific groups, demographics and leisure activities in research. As a means of exploring specific benefits it is valuable to look at specific populations as different groups have varying needs and wants (Cordes & Ibrahim, 1999).

For example, the young adult demographic is a valuable group to consider because as youth mature, they face important transition points in life, “the transition from adolescence to young adulthood is a pivotal point in development” (Sylvian-Bobiak & Caldwell, 2006, p. 74). At this transition point there is more responsibility, with less time for leisure resulting in less time spent in physical activity pursuits. Research has shown that young adulthood represents a time when lifelong physical activity habits and

behaviours can be positively influenced (Archer, Prober, & Gagne, 1987; suminski, Petosa, Utter, & Zhang, 2002). Understanding what keeps post secondary students committed to sport and physical activity, and understanding factors contributing to their commitment and intent to continue a physically active lifestyle will aid in understanding what measures to take to promote and encourage lifelong physical activity habits with a demographic set to make change.

Benefits of Recreational Sports and Intramurals in Post-Secondary Schools

To a great extent, leisure choices are based on demographic variables and lifestyle (Cordes & Ibrahim, 1999). With adolescents, over half of Canadian teenagers are sedentary and physical activity levels decrease as people age (Craig & Cameron, 2004). More young adults are choosing to pursue higher education; however, as these youth move from high school to college or university, students are becoming significantly less active. Bray and Born (2004) had students report their levels of physical activity in the last two months of high school and the first two months of university and found significant declines in both frequency and duration of vigorous physical activity. Offering diversity in campus recreational sports programs at the post-secondary level can help ensure that physical activity is a regular part of student life.

Recreational sport programs have found their way to the core of almost all recreation programs today offered in public and private, non-profit and for-profit, college and university, and employee-service recreation settings (Lewis, Jones, Lamke, & Dunn, 1998). Lewis et al. found that “growth in sports programming continues in most service settings, but one of the most prolific growth areas is found among the nation's colleges and universities” (p. 72). In the early twentieth century, recreational sports were

developed on college and university campuses as an outlet for the general population of students who were not on intercollegiate teams, which generally only support elite athletes (Lewis et al.). Collegiate recreational sports can be described as recreational programming which is primarily centered on sport and physically active pursuits that occur on the college and university campuses (Lewis et al.). The intramural program is one of the most common campus recreation sports options available for university students.

The benefits of intramurals and campus recreation extend beyond the physiological benefits to include psychological and social benefits. While sports are a common interest for many students, varsity or intercollegiate sports are not options for every student attending university as many would not, or could not, play at that level (Lewis et al., 1998). Colleges and universities subsequently recognized that more opportunities needed to be made available to the greater body of students. The concept of playing sports for the sake of participation began to take hold on college and university campuses. As a result, athletic departments were formed with the purpose of organizing and scheduling sport for the recreational enjoyment of the students (Lewis et al.).

In North America, intramurals and recreational sports are governed by their own professional association, the National Intramural Recreational Sports Association (NIRSA). NIRSA is “dedicated to excellence in student and professional development, education, research and standards. NIRSA's commitment, creativity and strategic partnerships are consistently demonstrated through outstanding programs, facilities and services” (NIRSA, <http://www.nirsa.org/about/mission/Default.aspx>, 2006). NIRSA established goals and standards of recreational sports programs as defined by The

Council for the Advancement of Standards in Higher Education (CAS). CAS continues to create and deliver a dynamic and credible Book of Professional Standards and Guidelines and Self-Assessment Guides that are designed to lead to a host of quality-controlled programs and services.

Having strong support and structure creates high quality intramural programs for colleges and universities. Successful intramural programs are also supported by the documented benefits of participation in these programs. Similar to many other recreation agencies, campus recreation professionals struggle to justify their services and demonstrate how they are an essential component of the larger institution (Ellis, Compton, Tyson & Bohlig, 2002). As a way of justifying their programs, intramural coordinators seek out support of their programs by stressing the benefits-based approach of campus recreation when resource allocation is being determined. In the area of campus recreational sport participation research has demonstrated the positive relationship between frequency of participation and positive health and quality of life (Ellis et al.). The benefits of intramural participation have been documented in the areas of physical health, college satisfaction, self-esteem, and academic stress.

Physical Activity

There has been increasing attention placed on the importance of physical activity as research continues to report the detrimental health effects of physical inactivity (Booth, 2007). Colditz and Marini (2000) note that “one proven way to combat obesity and sedentarism is to engage in regular lifelong physical activity” (p. 55). Research has also shown that regular physical activity can reduce the risk of high blood pressure, heart disease, and stroke (Cordes & Ibrahim, 1999). Regardless of one’s level of physical

fitness or ability, intramurals and recreational sports provide opportunities for all students by offering both competitive and non-competitive environments. This allows for the focus of the program to be placed on participation and people with different ability levels and goals can participate for a variety of reasons, while still being physically active. The primary benefit of participation in physical activity is improved cardiovascular fitness (Corbin & Lindsey, 2005). Students can be overwhelmed by a variety of responsibilities and campus recreation is an outlet for physical activity. This was evident in a 1996 survey completed at Ohio State University where “88.6 percent of the undergraduates indicated that recreational sports and fitness activity are important to them” (Haines, 2001, p. 25). Many students entering college or university have previous sport experience and need an outlet to continue their physical pursuits.

Academic

On university and college campuses, the recreational sport environment positively contributes to improved student work ethic and academics, as well as student self-image. Bryant and Bradley (1993) found that recreational and intramural sport provides an environment that promotes competence and mastery of leadership skills. Participation in intramurals enhances students ability to work cooperatively in a group (Barcelona, 2002). It was also noted that students improved in areas of defining and solving problems, improved their ability to guide and lead others, and gained self-confidence (Bryant & Bradley). The results of a study conducted at a public university campus revealed that of the 11,076 freshmen entering school in fall 1993 to 1995 who used the Student Recreation Complex (SRC) “persisted at a greater rate after 1 semester and after 1 year than their counterparts who did not use the SRC” (Belch, Gebel & Mass, 2001, p. 261).

In Astin's (1993) research on persistence to complete a post-secondary education he found support for the claim that participation in sports has a positive effect on persistence in school. Intramurals are seen as a social outlet as well and "students who become adequately integrated into the social and academic systems of their universities through participation in extracurricular activities, interaction with other students, and interactions with faculty develop or maintain strong commitments to attaining a college degree" (Christie & Dinham, 1991, p. 412-413). Another academic benefit of participation in campus recreation was having a sense of competence and purpose (Ragheb & McKinney, 1993). Student participation in intramurals positively influences factors that contribute to academic success (Bryant & Bradley, 1993; Barcelona, 2002; Belch, Gebel, & Mass, 2001). Intramural programs also serve as a key component to college and university satisfaction overall (Christie & Dinham, 1991).

College Satisfaction

In research conducted by Light (1990), and Smith and Thomas (1989) it was noted that recreational sports and extra-curricular activities are better indicators of academic and college satisfaction than academic measures as "more involvement in collegiate activities is strongly correlated with higher satisfaction with college life" (as cited in Belch, Gebel, & Mass, 2001, p. 256).

Beginning university or college requires students to adjust to the transition from secondary to post-secondary school. Also, each year of study brings new challenges, increased course load, and adjusting to independent living. These different changes can be a challenge for some students to confront and deal with. Recreation is a beneficial outlet for students as leisure can be "characterized by people interacting with others as a

result of mutual tastes and out of a sense of belonging” (Kyle & Chick, 2002, p. 429).

Students can use intramurals and recreational sports as a means of creating a social identity and finding others with similar interests. Scott and Godbey (1992) observed that different social environments represented a “unique scheme in life in which members share in a special set of meanings and in which various cultural elements . . . are created and made meaningful by social world members” (p. 49). Intramurals create a social environment for identity and meeting new people. Artinger et al. (2006) examined the social benefits for undergraduate students who were participants in a variety of intramural sports programs. The respondents indicated that they “benefited the most in the areas of personal social benefits . . . and social group bonding” (Artinger et al., p. 75-76).

Intramurals contributes to students’ college satisfaction through an enhanced feeling of belonging, creating more social outlets and bonding opportunities with their peer group which helps students to persist through school.

Self-esteem

Astin (1993) noted that “student’s emotional health and psychological well-being are positively correlated with the number of hours students spend participating in sport or exercise” (as cited by Collins, Valerius, King & Graham, 2001, p. 39). Emotional health is positively associated with involvement measures which are also related to satisfaction with campus life. Some of the specific involvement measures identified by university students include time spent in organizations and clubs, participating in intramural sports/intercollegiate athletics, spending time socializing with friends, and hours spent in sports or exercise (Astin). The study conducted by Collins et al. supported this as they found that students who had a high frequency of participation (five or more times per

week), had the highest self-esteem score. In that same study, students who identified participation as being very important also had the highest self-esteem score (Collins et al.). Kanters and Forrester (1997) randomly surveyed participants in a university volleyball intramural program regarding their motives for participating in leisure activities and their self-esteem and they found that participants were “motivated by the need to develop and maintain friendships and gain positive recognition from their peers” (p. 6) for their skills and abilities. Students also participated in school sports to challenge themselves and master skills. With respect to the overall self-esteem scores, “each of the volleyball participant groups reported significantly higher overall self-esteem than non-participants” and they also reported higher self-concept scores than non-participants (Kanters & Forrester, p. 30).

Stress

Academic pressures are always an issue with college and university students. Ragheb and McKinney (1993) conducted a study and found that the more students participated in recreation activities, the less they perceived academic stress. They also found that students with greater satisfaction in leisure had lower perceived academic stress. Leisure and sport involvement are a means of dealing with stress and school pressures. Kanters (2000) conducted a study on college students and found that those students who reported high participation scores and high amounts of perceived social support also reported lower exam period anxiety and stress. At a mid-western university, fourteen interviews were conducted with both male and female student athletes. The results of the interviews indicated that participation is a way of coping with stress and creates “social support and sense of connection or identification with others . . . leisure is

a coping strategy when it is connected to companionship” (Kimball & Freysinger, 2003, p. 130).

The body of research regarding the benefits of participating in campus recreational sports is continuing to grow for post-secondary students. Involvement in campus recreation and intramural sports has resulted in different benefits specific to the post-secondary demographic including: *physical activity/physiological* (Colditz & Marini, 2000; Corbin & Lindey, 2005; Haines, 2001); *academic persistence and improved self image* (Bryant & Bradley, 1993; Light, 1990; Smith & Thomas, 1989; Christie & Dinham, 1991; Ragheb & McKinney, 1993); *college satisfaction* (Kyle & Chick, 2002; Scott & Godbey, 1992; Artinger et al., 2006); *self-esteem* (Astin, 1993; Collins, Valerius, King, & Graham, 2001; Kanter & Forrester, 1997); and *handling stress* (Ragheb & McKinney, 1993; Kanter, 2000; Kimball & Freysinger, 2003). The growth of sports programming continues in most service settings but one of the most prolific areas of growth is with the variety of sports programs offered in post-secondary settings (Lewis et al., 1998). Acknowledging the documented benefits of intramurals increases the value post-secondary institutions place on these programs as these benefits contribute to successful post-secondary experiences and help foster healthy lifestyle choices.

While there have been well documented benefits of participation in post-secondary intramural sports, this research is limited to benefits while students are still in school. There has been little research on the contribution of campus recreation and intramural sports on developing students' healthy, active lifestyles after college and university. The literature fails to document the impact of participation in these programs

while being a student on measures linked to post-graduation participation rates. While intramural sports can positively affect the physical activity levels and sport participation rates of post-secondary students, their true value lies in their ability to encourage sport participation after school ends and during the post-school lives of graduates (Forrester, Ross, Geary, & Hall, 2007). Research indicates that physical activity levels drop from high school into university and this trend continues into adulthood, as almost half of all college students report a decrease in physical activity following graduation (Forrester et al.). It is important to have an environment that supports committing to and continuing physical activity behaviours beyond the college years.

Participation Patterns Across the Lifespan

In leisure and recreation services it is acknowledged that age related differences need to be examined with program planning and with research (Driver, Brown, & Peterson, 1990). As people age and move through various life stages their behaviour changes (Mannell & Kleiber, 1997). Change in leisure can occur by taking on new activities or dropping old ones, or “change can occur in the style or way people engage in long-term favourite leisure activities” (Mannell & Kleiber, p. 253). To understand change across the life span from childhood to older adulthood there needs to be a distinction between the different stages based on psychological issues or challenges faced by individuals in each stage (lifespan), as well as how history and culture illustrates norms concerning what is supposed to happen and when (life course) (Mannell & Kleiber). To understand leisure patterns and changes it is an asset to understand changes throughout life from childhood through to older adulthood.

Age is seen as a chronological measure of experience and maturity and an individual's "ability to function physically, cognitively, socially and emotionally" (Freysinger, 1999, p. 254). For example, a thirty-five year old adult is expected to be able to manage and express their emotions better than a five year old. There are different phases in life that can be identified by age. The first stage of life has been identified as the preparation stage. This stage covers childhood when different aspects of development including emotional development, creativity, cognitive thinking ability, social integration, and social communication (Searle & Brayley, 2000). Childhood is a critical time of development for children where they may be exposed to activities that they learn from and carry through life (Searle & Brayley). In adolescence, individuals strive for independence, try to understand intimacy, seek peer acceptance, and work to identify with their cohorts (Searle & Brayley). This progresses through to the establishment phase which is considered a "period during which individuals begin the process of making commitments that constitute that which they find satisfying in their life" (Searle & Brayley, p. 229).

While the majority of development occurs in the early stage of life including childhood and adolescence, development still continues through adult life. The adult phase of life ranges from the early twenties through age fifty to fifty-five in which "attitudes and behaviours at each stage differ among adults (and are) influenced by generational and socioeconomic factors and by individual life experiences and perceptions" (Cordes & Ibrahim, 1999, p. 99). The final stage identified by Searle and Brayley is the culmination stage. Senior adulthood can be separated into two stages; early

seniors who range from sixty years of age to mid-seventies and then seniors who are seventy-five years of age and on (Cordes & Ibrahim).

Chronological age is also a reflection of the historical events that occur during one's lifetime. For example, individuals who lived through the great depression have different experiences than younger generations. Freysinger (1999) explained that "a group of individuals who share the same year of birth and subsequent events at the same point in the life span is known as a birth cohort" (p. 254). Each birth cohort shares different experiences as a result of the historical meaning that age holds, making each cohort unique because of experiencing certain life events at a particular age. For example, those who grew up in the 30's and 40's experienced the great depression. Children today have a completely different experience of equality than their parents did. For example, multiculturalism, gender equality and same sex relationships are more prevalent, accepted and talked about today than they were for people growing up in the 50's and 60's. Finally, age interacts with other areas of personal identity including gender, race, ethnicity and social class (Freysinger). One area of concern is if research establishes that there are significant differences between study groups; are the differences a result of age or cohort? It is difficult to determine and make sound conclusions with age and leisure research.

There have been consistent patterns that have developed through leisure and age research in studies where comparisons are made in physical activity patterns at different stages of life. While the strength of comparisons varies across the research field as a result of different procedures, generally, the results show a positive correlation between sport participation as a youth and later life participation (Bucher, 1974; Howell &

McKenzie, 1987; Kelly, 1980; Malina, 1996; Montoye et al., 1959; Morgan & Montoye, 1984; Paffenburger et al., 1986; Powell & Dysinger, 1987, Rees et al., 1986; van Mechelen & Kenper, 1995; Vanreusel et al., 1997; Watkins, 1983; White & Curtis, 1990; Yang, 1997) and the strength of the relationship varies across studies as a result of the diversity of research procedures used (Curtis, McTeer, & White, 1999). For instance Curtis et al. determined that individuals who were competitive in high school athletics were more involved in sports as adults. Even for participants who were twenty-two to forty-two years past high school, “former inter-school sports participants were much more involved [in sport] than others” (Curtis et al., p. 359). This demonstrates the importance of remaining involved in sports pursuits throughout young adulthood, as the results indicate that later participation rates will benefit as well.

The notion that prior participation rates have an impact on future participation can be explained by the Leisure Repertoire Theory. The leisure repertoire theory points to the importance of developing skills and personal resources during the early years in order to participate in a variety of leisure pursuits throughout life (Fache, 1987). Leisure repertoire theory is based on the assumption that people regularly participate in activities they feel they do well in; confidence in the activity that is pursued leads to greater participation rates (Mobily, Lemke, Ostiguy, Woodard, Griffiee, & Pickens, 1993). Leisure repertoire refers to the number of different activities individuals engage in during their leisure. Some research has speculated that leisure repertoire may decrease with age, but intensity in remaining activities increases (Searle & Brayley, 2000). An individual’s leisure “activities and relationships that have been cultivated and maintained over a long period of time in people’s lives are the most likely to contribute to well-being and sense

of integrity” (Mannell & Kleiber, 1997, p. 267). After trying new leisure pursuits throughout life; in later adulthood it becomes more important to look at the quality of the leisure activity rather than the quantity of leisure. As adults age they become more conservative about their leisure lifestyle and tend to make leisure choices from their own repertoire of skilled activities (Iso-Ahola, 1980; Iso-Ahola, Jackson, & Dunn, 1994; Roberts, 1999). By participating in a variety of leisure pursuits early in life, there is more likelihood that an individual will find their leisure time fulfilled in later life. The greater the repertoire of choices the more likely individuals will remain a committed sport participant when moving from adolescence to adulthood. The inclusive multiple sport orientation of intramurals may be well suited to achieve the goal of facilitating physically active adults that are committed sport participants.

This leads to another common trend in the research where participation rates in sport and physical activity significantly decrease with age (Curtis et al., 1999; Cordes & Ibrahim, 1999; Vanreusel et al., 1997). In research done by Vanreusel et al., they determined that individuals with a background in recreational or non-competitive sports continued participation later in life more than those who were involved in competitive sport. The results of the study indicated that “subjects with a recreational sport participation style appear to have better chances for continued sport involvement from youth to adulthood” (Vanreusel et al., p. 377). Cordes and Ibrahim recognize that as a person ages they take on new responsibilities that consume both time and energy, resulting in leisure and recreation getting pushed aside or neglected. The findings in a study done by Curtis et al. (1999) indicated that as both males and females age their level of involvement declines; however, individuals who were former sport participants were

much more involved than others. While there are added responsibilities with age causing sport participation to decrease, there is also a positive link between prior sport participation as a student and later adulthood involvement. These findings support the importance that sport commitment plays in remaining active across the lifespan.

There are considerable gaps within the body of knowledge surrounding leisure across the life span. There are a limited number of researchers examining the issue from too many perspectives, “resulting in a relatively small body of knowledge” (Searle & Brayley, 2000, p. 224). While different models of aging and development exist, they cannot be proven; the value lies more in their usefulness (Fresinger, 1999). Longitudinal research is difficult to conduct and generalize to all groups of the same age as there are so many factors that change and evolve as time passes. The variety of models takes multiple perspectives on aging and lifespan but cannot accurately determine cause and effect of leisure patterns. Different models and studies allow more understanding of “how and why leisure changes across the course of life, and how and why leisure shapes the process of aging or development” (Freysinger, p. 256).

There are limitations with both longitudinal and cross-sectional approaches as both methods are not able to take a clear picture of any one age group and generalize. Within life course and lifespan leisure research there has been little research done on the university student and this is a pivotal time in life as “development is not complete when one leaves adolescence” (Mannell & Kleiber, 1997, p. 245). The post-secondary demographic needs to be included in the leisure lifespan literature as this group experiences a significant change in life and leisure pursuits. Individuals entering the university environment are experiencing extreme lifestyle changes and they need to

balance their new academic structure and work load, social networks, and a new living environment (Von Ah, Ebert, Ngamvirtoj, Park, & Kang, 2004). This makes the transition period to post-secondary school an appropriate time to establish healthy lifestyle behaviours (Dinger & Waigandt, 1997). However, the research that examines different stages of life is theoretically weak with multiple perspectives on different life stages, not to mention the weaknesses of both cross-sectional and longitudinal research methods (Freysinger, 1999). This makes it necessary to use other approaches, including the use of psychological constructs linked to individual's commitment, resolve, desire or intention to continue playing sports or being physically active, to study the impact of prior or current sport participation on the likelihood to be physically active in the future.

Relevant Theories and Models

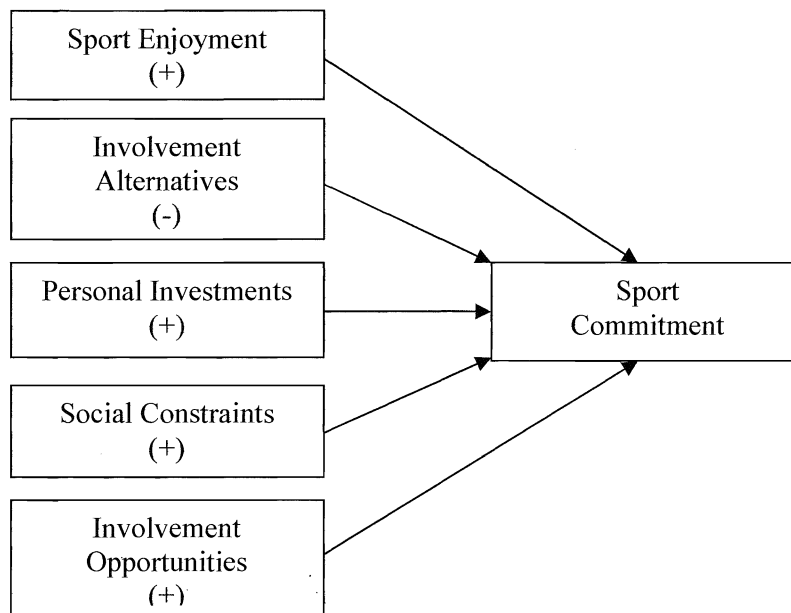
Sport Commitment Model

One measure of a person's likelihood to continue playing sports or to be physically active in the future is their level of commitment to the particular activity. Commitment is a difficult concept to define and can be internalized by individuals in different ways. Wortman and Sorrentino (1987) define commitment as "whatever it is that makes a person engage or continue in a course of action when difficulties or positive alternatives influence the person to abandon the action" (p. 2). Brickman (1987) viewed commitment as a state of obligation ('have to commit') and as a functional resolve ('want to commit'). In the case of sports, commitment is defined as "a psychological state representing the desire or resolve to continue sport participation" (Scanlan, Carpenter, Schmidt, Simons & Keeler, 1993, p. 1). Sport commitment occurs when an individual demonstrates persistence, participating despite intervening factors such as school work,

jobs and family responsibilities. Scanlan et al. introduced a sport-specific theoretical model of commitment that suggests sport commitment occurs as a result of five different categories. Four of the five categories that make up sport commitment are sport enjoyment, involvement opportunities, personal investments, and social constraints, and they are hypothesized to have a positive relationship (+) to sport commitment although involvement alternatives (the fifth category) possesses a negative relationship (-) to sport commitment (Refer to Figure 1).

The first category of the sport commitment model, *sport enjoyment*, is defined as “a positive affective response to the sport experience that reflects generalized feelings such as pleasure, liking and fun” (Scanlan et al., 1993a, p.6). There has been a positive association between enjoyment and the desire to exert effort and persist in a selected sport (Scanlan, Stein & Ravizza, 1989). Another factor of the sport commitment model is *involvement opportunities* where valued opportunities are perceived to remain if involvement continues (Scanlan et al., 1993a). These opportunities can be perceived as participating to stay fit or continuing to participate because it offers a chance to be with sport friends, as “involvement opportunities support a sense of attachment and, therefore, commitment to the activity” (Scanlan et al., 1993b, p. 23). Sport involvement offers an aspect of the sport that cannot be transferred to a different environment or sport, making an individual stay committed.

Figure 1. Five Factor Sport Commitment Model

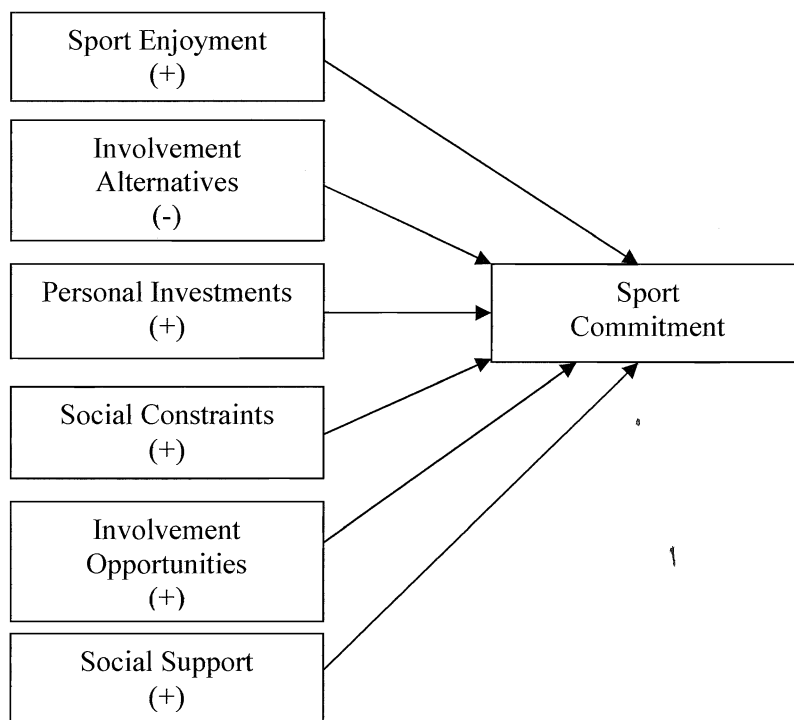


The third component in the model is *personal investments* which includes personal resources invested in an activity that could not be recovered if participation were discontinued (Scanlan et al., 1993a). Some common examples include effort, time, and money. The fourth construct is *social constraints* and is defined as “social expectations or norms which create feelings of obligation to remain in the activity” (Scanlan et al., 1993a, p. 7). With this component there is a sense of social pressure to participate from parents, coaches, peers, and teammates. It is predicted that greater sport commitment is related to higher ratings of these four determinants in the model.¹

The final construct of the sport commitment model is *involvement alternatives* which occur when alternatives are perceived to be more attractive than the current sport pursuit (Scanlan, et al., 1993a). The assumption is that individuals consider alternative choices between the current activity and others. Having more attractive alternatives negatively influences commitment as it is predicted to lower sport commitment. In recent

studies, *social support* has been added as a sixth determinant in sport commitment research where unconditional encouragement is positively related to commitment (Scanlan et al., 2003; Weiss, Kimmel, & Smith, 2001; Wilson et al., 2004). Social support is defined as “the support and encouragement the athlete perceives significant others provide for their involvement in sport” (Carpenter, 1993, p. 59). Overall, the sport commitment model theorizes that sport enjoyment, involvement opportunities, personal investments, social constraints and social support, along with lower involvement alternatives will lead to the desire and resolve to continue sport participation (Refer to Figure 2).

Figure 2. Six Factor Sport Commitment Model



One of the main advantages of the sport commitment model is that it was designed to be used in a variety of sport environments with diverse demographics. In the youth-sport domain, Scanlan et al. (1993a) were the first to conduct a study using the

sport commitment model. The intent of the study was to establish a preliminary measurement survey and establish a background for future research with the model. In a later study done by Raedeke (1997), sport commitment was used to understand athlete burnout among swimmers. Although the original work done by Scanlan et al. (1993a) predicted a positive relationship with social constraints and commitment, “the social constraints construct has shown either no relationship or a weak negative relationship with commitment” (Raedeke, p. 399). Research using the SCM has been done in a variety of different sport settings and with a range of subjects all with a different focus on commitment.

The sport commitment model has also been applied to the areas of fitness and exercise. The results of a study conducted by Wilson et al., (2004) “partially support certain structural relationships among commitment constructs outlined by the SCM in the exercise domain” (p. 414). In their study, the results indicated that personal investments and satisfaction were the strongest predictors of exercise commitment. The research also indicated that the ‘want to’ component of commitment resulted in greater exercise frequency (Wilson et al.). Another study was conducted in Greece and aimed to test the validity and applicability of the Sport Commitment Model with exercise and fitness participants. The results indicated that the four dimensions including enjoyment, personal investment, social constraints, and involvement opportunities, contributed significantly to the prediction of commitment (Alexandris, Zahariadis, Tsorbatzoudis, & Grouios, 2002). The sport commitment model can be used to explore why some people are able to commit and remain loyal to a fitness program or membership.

The Sport Commitment Model has also been used in research with elite athletes and young athletes in highly competitive sports environments. The focus of research in this area has been commitment with international teams (Scanlan, Russell, Beals & Scanlan, 2003) and youth competition (Weiss, Kimmel & Smith, 2001). At the international level, staying active and training with the New Zealand All Blacks rugby team requires a high level of commitment. After conducting interviews with players on the team, the results demonstrate the strong relationship between valuable opportunities (friendship, tours/travel, competitive achievement, and performance recognition) and sport enjoyment (Scanlan et al., 2003). Enjoyment was also a dominant factor in the study by Weiss, Kimmel and Smith. They noted that research involving the SCM had sport enjoyment emerge as a strong determinant of sport commitment. Consequently, Weiss et al. constructed a second modified model in which sport enjoyment was used as a mediator between the other determinants and sport commitment. Results provided support for both models (the original and second model using sport enjoyment as a mediator variable) and viable explanations of commitment, showing the relevance and importance of enjoyment in sport commitment (Weiss, Kimmel & Smith).

The Sport Commitment Model is used frequently in research with children and youth in sport. Regarding the effect of self-determination in sport commitment, Zahariadis, Tsorbatzoudis and Alexandris (2006) surveyed young athletes (age 12 to 15) from soccer, basketball, volleyball, handball, and water polo teams. Their research showed a strong relationship between commitment and intrinsic motivation scores and that extrinsic motivation was negatively related to sport commitment (Zahariadis et al.). Carpenter and Scanlan (1998) also used a younger demographic to study how

commitment changes over time. High school soccer players completed a survey around the middle of their season and again at the end of their regular season. For the soccer players who found their sport enjoyment and involvement opportunities had declined, “there was a corresponding decrease in their commitment. For those players whose involvement opportunities had increased, there was a corresponding increase in their commitment” (Carpenter & Scanlan, p. 356).

The Sport Commitment Model is a good fit for research in the area of intramural and recreational sports participation for several reasons. First, the original intent of the model was “to examine the motivation underlying persistence in organized sports” (Scanlan et al., 1993a, p. 2). The structure of intramurals is a good fit with the original intent of the model as post-secondary intramural sports are well planned and organized. Second, the model provides a theoretical framework to study enjoyment as enjoyment is a major attraction variable for athletes (Scanlan et al., 1993a). In the university environment, students view sport as an escape from stress as sport participation acts as a buffer when their participation is self-determined (Kimball & Freysinger, 2003). Furthermore, The Sport Commitment Model has yet to be applied in the context of post-secondary campus recreational sports. While the model has been applied in recreational and competitive settings, none have focused on the intramural setting which targets a younger demographic. Third, each of the determinants of the model can be applied to a variety of athletes who are active in recreational and competitive sports. This applies well to intramurals as students are not elite athletes but have the option of participating at a more competitive level (competitive A) or more recreationally for fun (competitive B).

Another reason to use the SCM in the intramural environment is to expand the body of knowledge regarding the theory and test the theory in a new field. Based on sport motivation literature, Carpenter (1993) created additional determinants of commitment including social support (as cited in Weiss, Kimmel, & Smith, 2001). Social support, or unconditional encouragement, is positively related to commitment. As more potential determinants are added to the model, research testing the SCM should continue to consider these additions. The inclusion of a sixth construct of social support in the SCM is useful within the intramural environment as intramurals are an important part of college social life and contribute to students social integration into the university community (Artinger et al., 2006). In a study on the social benefits of intramural sports, post-secondary students “indicated that they benefited most in the areas of personal social benefits and social group bonding” (Artinger et al., p. 75-76). The social aspect of intramurals is an important benefit for participants and warrants including social support as the sixth construct when using the SCM with intramural sport participants.

While there are positive reasons to use the SCM in research, the model also has its shortcomings. In general the model is relatively young, having only been around for fourteen years, leaving plenty of topics, demographics and levels of competition to be studied using the model. There are still changes that are being made to the model as researchers are adding constructs to it. Another critique of the model is that previous research has indicated some inconsistency in the relationship between determinants (Wilson et al., 2004) where there have been opposing results regarding the relationships between the determinants. Another area of the model to question is whether it is safe to assume the model can be applied to different populations as the original model was

developed and tested for youth aged 10 to 19 years. The results of any study conducted using the SCM will vary as the factors that impact commitment change as people grow and age. Using the SCM in a variety of sport environments with diverse demographics could be considered a weakness in the model; this diversity could also be seen as an advantage of the model. It would be expected that perceptions of commitment for children in sport and the outlook on commitment with adults will vary as there are different influences involved.

Also, the additional determinant, social support, is not from the original model meaning the relationships between determinants proposed within the SCM and commitment warrants additional scrutiny particularly in applications of the model to new contexts or populations (Wilson et al., 2004). While this is a downfall of the model, it also provides a rationale for why the SCM should be used as there is a need to add research to the growing body of knowledge with different populations in a well-defined sports context, in this case post-secondary students participating in intramurals.

Another critique of the SCM is that it is not based on actual participation but on an individual's perception of their attachment to sport. Sport commitment is defined as the desire and resolve to continue participation (Scanlan et al., 1993a), representing a psychological construct, not the actual behaviour of staying in or leaving an activity. Ultimately, psychological commitment "should predict behavioural commitment, such as effort and persistence" (Weiss & Weiss, 2007, p. 90). The SCM assumes that the psychological attachment an individual has to their sport participation plays a significant role in determining their persistence and continued involvement, however, the actual behaviour of staying in the activity is not measured.

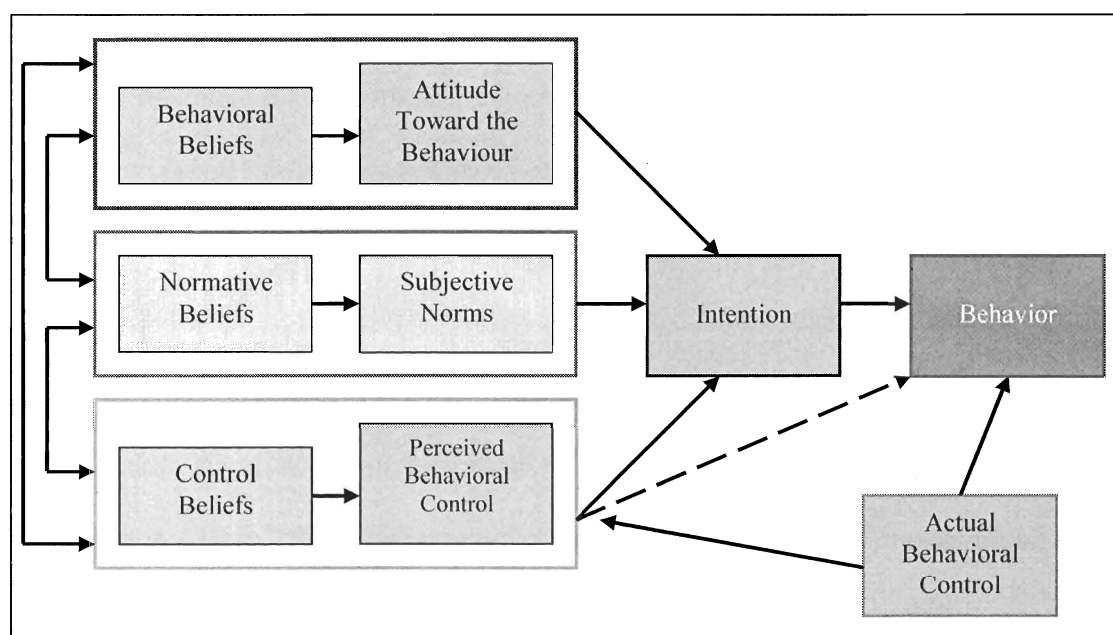
The Theory of Planned Behaviour (TPB) (Ajzen, 1988, 1991) could be used to extend the SCM. Where the SCM examines the perception of an individual's attachment to sport and not the actual participation, the TPB focuses on intention, which according to the theory is the strongest predictor of behaviour. If people are positively disposed to physical activity and sport, the likelihood that they will perform that behaviour increases, as they are more intent on participating.

Theory of Planned Behaviour

The Theory of Planned Behaviour (TPB) (Ajzen, 1988, 1991) is one of the more widely used frameworks for understanding and predicting health behaviours (Conner & Sparks, 1996) and the study of human action (Ajzen, 2001). The theory of planned behaviour provides a framework to study attitudes toward behaviours. According to the theory, the most important determinant of a person's behaviour is intent and the individual's intent toward the behaviour includes; behavioural beliefs, evaluations of behavioural outcomes, subjective norms, normative beliefs, and the motivation to comply (Ajzen, 1991). The theory of planned behaviour is a model based on an individual's behavioural intention and perceived behavioural control (Ajzen, 1991). According to Ajzen's theory, human behaviour is guided by three types of considerations; beliefs about the likely consequences or other attributes of the behaviour (behavioral beliefs), beliefs about the normative expectations of others (normative beliefs), and beliefs about the presence of factors that may further or hinder performance of the behaviour (control beliefs) (Ajzen, 2002). In these respective sections the three independent constructs that make up the theory of planned behaviour are attitude, subjective norms, and perceived behavioural control (Ajzen) (Refer to Figure 3). Armitage (2005) clarifies these

constructs by explaining that “people are more likely to intend to participate in physical activity if they are positively disposed toward it (attitude), if they perceive social pressure to do so (subjective norm), and if they believe they will be successful (perceived behavioral control)” (p. 235).

Figure 3. The Theory of Planned Behaviour



The theory of planned behaviour is based on an individual’s way of life and how those beliefs determine behaviours and actions. Some of the more common health behaviours explained by the theory include *drug use*, specifically *alcohol* (Armitage et al., 1999; Conner & Norman, 1996; Marcoux & Shope,¹ 1997; Rise & Wilhelmsen, 1998; Wall et al., 1998) and *tobacco* use (Godin et al., 1992; Hanson, 1997; Hill et al., 1997; Norman et al., 1999). The theory of planned behaviour is viewed as a model of social behaviour and has also been frequently used in the field of exercise and physical activity (Armitage, 2005).

While there is an extensive body of evidence attesting to the importance of the theory of planned behaviour for predicting exercise behaviour (Blue, 1995; Hagger, Chatzisarantis, & Biddle, 2002; Hausenblas, Carron, & Mack, 1997) there are limitations. In research conducted using the theory of planned behaviour a great deal is known about the ability of scholars to use the theory to predict the initiation of behaviour, but “very little research has examined the factors important in maintaining behavior” (Armitage, 2005, p. 236). There is limited research that tests the ability of the theory of planned behaviour to predict the maintenance of health behaviour. Another limitation of the theory is that while it is “frequently used to identify the determinants of health-related behavior . . . it provides little guidance on how these determinates can be changed” (Fishbein & Ajzen, 2005, p. 28). With little guidance on how to change the determinants it is difficult to know how to best promote behavioural change. The intent of this study is not to change people’s physical activity behaviours but to look at current levels of participation and commitment, and determine the students’ intent to continue participating in intramural sports and other sports and physical activities after graduation. The theory of planned behaviour connects well as a central factor in the theory is “the individual’s intention to perform a given behavior” (Ajzen, 1991, p. 181). The theory takes into account how hard people are willing to try and how much effort they are willing to exert in order to continue performing their health behaviour.

This is similar to the Sport Commitment Model where the six constructs of the model were chosen to reflect the psychological desire and the desire to continue participation with a specific program or sport (Scanlan et al., 1993a). It would be interesting to determine if psychological commitment (SCM) predicts behavioural

intentions, which is the most important determinant of a person's behaviour according to the Theory of Planned Behaviour. More specifically, it would be interesting to examine the relationship between sport commitment and intention to: (i) continue participating in intramural volleyball, (ii) continue participating in intramurals, and (iii) continue participating in sports and fitness activities after graduation as well as to determine if sport commitment is a moderating variable in the Theory of Planned Behaviour.

Chapter Three

Methodology

Guided by the Sport Commitment Model (Scanlan et al., 1993a), the intent of this study was to examine post-secondary students' commitment to sport through intramural participation. Each of the following are discussed in an attempt to describe the methods that were employed in this study: (a) design of the study, (b) arrangements for conducting the study, (c) selection of subjects, (d) procedures for testing and gathering data, (e) instrumentation, (f) reliability and validity, and (g) treatment of the data.

Design of the Study

The purpose of this study was to examine the sport commitment of post secondary intramural sport participants. Also, based on current perceptions of sport commitment and participation, students were asked about their intentions to participate in sport in the future. Data was collected through on-site administered surveys from students currently involved in the intramural program. Census sampling was used to invite students to participate in the study. Surveys were distributed before or after the intramural games and they were available to complete at a table outside the gymnasiums. The questionnaire was based on the Sport Commitment Model (Scanlan et al., 1993a) and the Theory of Planned Behaviour (Ajzen, 1988, 1991). Results were inputted and analyzed with the Statistical Package for the Social Sciences (SPSS) computer program, version 15/16. The study began in February 2008 and will be completed in winter 2009. Results for the participants will be available upon request in Spring/Summer 2009.

Arrangements for Conducting the Study

Les Gilson, the Intramural Program Co-ordinator at Brock University provided both verbal and written approval to conduct this study. Mr. Gilson was aware of the purpose and the intentions of the study. He also provided the number of students who participated in the intramural volleyball program during the second semester of the 2006-2007 academic school year. The written approval from the Intramural Program Coordinator was included in the ethics application submitted to the Research Ethics Board (REB) at Brock University. Approval from the REB at Brock University was granted before any data was collected. The Research Ethics Board required a very clear description of what the study entails, the benefits and how the research will be conducted. The Research Ethics Board granted approval for this study ‘as is’ on February 12/2008.

Selection of Subjects

Subjects selected for this study were participants in Brock University’s intramural volleyball program. Volleyball was the selected sport because it is a co-ed program and allows for both males and females to be surveyed. At Brock University the intramural volleyball program is the largest intramural sport with the most students participating, averaging approximately 700 students each year. The hope was that with more participants there was a greater chance of having representation of students from first year through graduate studies, and a combination of students living both on and off-campus as well as students who participate in a variety of different intramural sports. Furthermore, previous research using this demographic has found that students participate for a variety of reasons (Kanters & Forrester, 1997), derive a variety of social benefits from their participation (Artinger et al., 2006) and tend to participate in a number of other

intramural sports in addition to volleyball making this a fairly heterogeneous and potentially representative group of intramural sport participants.

Gaining access to the study demographic was easy, making it less complicated to find students to participate in the study. The best way to achieve an accurate representation from the study demographic was to conduct a census sample. Census sampling was used so every participant has an equal chance of being selected to ensure the sample was a fair representation of the intramural participants, allowing the ability to generalize to the population. The subjects who participated in the study came from the over seven hundred male and female students who participated in the co-ed volleyball program.

In general, a larger sample size represents a population better than a smaller sample size. Veal (1997) suggests that the minimum sample size can be inferred from the statistical analysis method and the number of questions in the questionnaire. Sample size is important for the results of the survey to be reliable. In this study regression was employed to determine the utility of the six constructs in explaining sport commitment in a sample of post-secondary intramural sport participants. As a guide with regression, Tabachnick and Fidell (2007) refer to rules where N is greater than or equal to $50 + 8m$ (where m is the number of independent variables) for testing the multiple correlation and N is greater than or equal to $104 + m$ for testing individual predictors. These rules assume “a medium-size relationship between the IV’s and the DV, alpha = .05 and beta = .20” (Tabachnick & Fidell, p. 123). In the Sport Commitment Model there are six independent variables, therefore based on Tabachnick and Fidell’s advice, regression would require $50 + (8)(6) = 98$ cases to test regression and $104 + 6 = 110$ cases for testing individual

variables. Since the researcher is interested in both, it is best to choose the larger number of cases; 110 surveys (Tabachnick & Fidell). This calculation was based on the Sport Commitment Model over the Theory of Planned Behaviour as there are more determinants to consider with the SCM (6) versus the TPB (4). This would provide a larger number of necessary cases and it is always better to have a larger sample.

With respect to factor analysis, another statistical technique being used, Comrey and Lee (1992) as a guide note, “sample sizes of 50 as very poor, 100 as poor, 200 as fair, 300 as good, 500 as very good, and 1000 as excellent” (as cited in Tabachnick & Fidell, 2007, p. 613). Tabachnick and Fidell suggest that where factor analysis is used, it is best to have at least 300 cases or surveys collected. While regression calls for 110 cases, factor analysis calls for a minimum of 300 cases. Since a larger sample size generally represents a population better than a smaller sample size, census sampling continued in this study until over 300 questionnaires were collected to analyze.

Procedures for Testing and Gathering Data

The data for this quantitative study was collected through survey responses from post-secondary students at Brock University. At the start of the winter intramural league in February/March 2008, participants from intramural volleyball teams were recruited to participate in the study. Surveys were collected over the course of three weeks from both males and females in the co-ed volleyball program running every Sunday, Monday and Wednesday evening. The researcher set up a table near the gym entrance at the beginning of each night with surveys ready and available and invited any students who were there to play volleyball to participate in the study. The researcher used the census sampling technique for obtaining data from the students. This study used census sampling so that

every individual had an equal chance of being selected. This was ensured by having the researcher distribute surveys every night that volleyball was running (Sunday, Monday and Wednesday) and the surveys were available for all the teams, no one was specifically targeted. All the participants had an equal opportunity to participate and were male and female volleyball players in the co-ed competitive A and competitive B divisions, the only two divisions in intramural volleyball. The survey included a letter of informed consent which needed to be completed for the survey to be included in the study. Once the participants completed their surveys the surveys were placed in a sealed box so students' identities were not linked to their responses and to assure confidentiality. Anonymity was maintained, as the survey did not ask the participants to reveal any information that could link their identity to the information they provided which was also explained within the informed consent letter included with the survey. Furthermore, since I am interested in the average responses of the entire group of participants, subjects were not identified individually in any way in written reports of this research. Prior to distributing the surveys a pilot test was done to determine if any problems exist with the instrument or the sample (Henderson & Bialeschki, 2002). In this case the sample group was composed of 14 intramural volleyball participants from one team as they were identical to the individuals who were the recipients of the survey which is a requirement of the sample group (Henderson & Bialeschki). There were no modifications made to the survey and they were distributed as originally seen by the sample group of students.

Instrumentation

For the study, the best means of gathering the data was to use a self-administered questionnaire. This enabled the researcher to ask a number of questions in a short period

of time (Alreck & Settle, 1985). The questions used to measure each intramural sport participant's perception of their sport commitment and intentions to participate in sport in the future were based on the Sport Commitment Model (SCM) (Scanlan et al., 1993a) and the Theory of Planned Behaviour (Ajzen, 1988, 1991). Based on the SCM, questions focused on the constructs of sport enjoyment, involvement opportunities, personal investments, social constraints, and involvement alternatives. The original questions for the SCM questionnaire were taken from the Athletes Opinion Survey (Scanlan et al., 1993a). While this model is relatively new, one of the suggested additions to the model is to include the construct of social support. As a means of determining if the social support construct should be an addition to the original SCM (Scanlan et al., 1993a), it was also included in the survey.

The majority of the survey questions were structured and closed ended questions. There was a demographics section, questions about commitment, each of the six constructs of the SCM, and intent to continue participation based on the Theory of Planned Behaviour. The sport commitment questions used a five point Likert scale that had subjects rate their responses according to each attribute that best represents their psychological perception of their commitment to sport. Using the Likert scale allows for consistency in responses, comparable data, and it is easily coded. The SCM was used as the basis for this study for several reasons adding diversity to the already existing body of knowledge. More specifically, the following questions are a sample of what was used to measure each construct:

Sport Commitment- defined as a psychological state representing the desire and resolve to continue sport participation in a particular program, a specific sport or sport

participation in general (Scanlan et al., 1993a) was measured using four questions measured on a 5-point Likert scale ranging from 1 = *not at all dedicated* to 5 = *very dedicated*. For example, questions such as “how dedicated are you to playing on an intramural team?” or “how difficult would it be for you to quit your intramural team?” were used to measure sport commitment.

Sport Enjoyment – defined as a positive affective response to the sport experience that reflects generalized feelings such as pleasure, liking, and fun (Scanlan et al., 1993) was measured using four questions measured on a 5-point Likert scale ranging from 1 = *not at all* to 5 = *very much*. For example, questions such as “do you enjoy playing intramurals this semester?” or “are you happy playing intramurals this semester?” were used to measure sport enjoyment.

Involvement Alternatives – defined as the attractiveness of the most preferred alternative(s) to continue participation in the current endeavour (Scanlan et al., 1993a) were measured using five statements measured on a 5-point Likert scale ranging from 1 = *not at all how I feel* to 5 = *very much how I feel*. For example, statements such as “compared to participating in intramurals, there are other things I could do which would be more fun” or “I would like to be doing something else instead of participating in intramurals” were used to measure involvement alternatives.

Personal Investments – defined as the attractiveness of the most preferred alternative(s) to continued participation in the current endeavour (Scanlan et al., 1993) were measured using four questions measured on a 5-point Likert scale ranging from 1 = *none* to 5 = *very much*. For example, questions such as “how much of your time have you

put into intramurals this semester?” or “how much energy have you put into intramurals this semester?” were used to measure personal investment.

Social Constraints – defined as social expectations or norms which create feelings of obligation to remain in the activity; the sense of social pressure to participate (Scanlan et al., 1993) were measured using four questions measured on a 5-point Likert scale ranging from 1= *not at all how I feel* to 5= *very much how I feel*. For example, statements such as “I feel I have to play in intramurals so I can be with my friends” or “people will be disappointed in me if I quit intramurals” were used to measure social constraints.

Involvement Opportunities – defined as valued opportunities that are present only through continued involvement (Scanlan et al., 1993) were measured using three questions measured on a 5-point Likert scale ranging from 1= *not at all* to 5= *very much*. For example, questions such as “would you miss your friends in intramurals if you left?” or “would you miss the good times you have had playing sports this semester if you left intramurals?” were used to measure involvement opportunities.

Social Support – defined as unconditional encouragement and positive regard (Weiss & Weiss, 2003) and is the degree of perceived support received from other people for participating (Wilson et al., 2004), was measured using three statements measured on a 5-point Likert scale ranging from 1 = *not at all how I feel* to 5 = *very much how I feel*. For example, statements such as “people important to me support my intramural participation” or “people important to me think it is okay to participate in intramurals” were used to measure social support.

The last section on the questionnaire was based on the Theory of Planned Behaviour (TPB) (Ajzen, 1988, 1991) and included questions related to students' intent to continue participation. The SCM focuses on current participation patterns in sport where the TPB provided more detail about future intentions to stay committed to sport. The theory was divided into four main constructs (1991) and this was how the different sections of the survey were designed. The TPB questions came from Ajzen's website (<http://people.umass.edu/aizen/>) and the manual for constructing a questionnaire based on the TPB (Francis, et al., 2004). More specifically, the following questions are a sample of what was used to measure each construct:

Attitudes – defined as the degree to which a behaviour or action is positively or negatively valued (Ajzen, 1991), were measured using the statement “for me, participating in intramurals regularly over the next month will be: ”. This was followed by four different semantic differential statements based on a 5-point Likert scale ranging from 1= harmful, foolish, not enjoyable and unpleasant to 5=beneficial, wise, enjoyable and pleasant.

Subjective Norms – defined as the perceived social pressure to engage or not to engage in a behaviour (Ajzen, 1991), were measured using three statements measured on a 5-point Likert scale ranging from 1 = *not at all* to 5 = *every week*. For example, statements such as “I expect to participate in intramurals” or “I want to participate in intramurals” were used to measure subjective norms.

Perceived Behavioural Control – refers to people's perceptions of their ability to perform a given behaviour or action (Ajzen, 1991) and was measured using eight statements measured on a 5-point Likert scale ranging from 1 = *strongly disagree* to 5 =

strongly agree. For example, statements such as “most people who are important to me think that I should participate in intramurals” or “whether I participate in intramurals or not is entirely up to me” were used to measure perceived behavioural control.

Intention – defined as the indication of an individual’s readiness to perform a given behaviour and is considered to be the immediate antecedent to the actual behaviour (Ajzen, 1991), was measured in three different ways on the survey. There were two intention questions that addressed current participation in intramural volleyball. An example of this question is “I intend to participate in intramural volleyball on a regular basis” with a five-point Likert scale ranging from 1 = *strongly disagree* to 5 = *strongly agree*. The next intentions question addresses future participation in intramurals overall. An example of this question is a fill in the blank statement that states “over the next month, I intend to participate in intramurals at least ____ times per week (including volleyball and all other intramural sports offered at Brock)”. The final intentions question addresses future participation in intramurals and other sport pursuits. An example of this question is “I intend to participate in intramurals or other sports and physical activities in the future” with the Likert scale ranging from 1 = *I definitely will not* to 5 = *I definitely will*.

Reliability and Validity

The measurement tool used in the study was a questionnaire. Accurate results were expected in the study, contributing to the reliability because repeated measurements were made under identical conditions. This was accomplished in the study by using the same questionnaire for all volleyball participants within Brock intramurals, allowing the results to be kept consistent. Also, the reliability was increased when the number of items

was increased in the questionnaire created for the study, using the SCM. There were multiple questions in each section, which were taken from the SCM. Each construct in the SCM had a set of questions specific to intramurals. The benefit of using the SCM in the questionnaire is that sport commitment has been used in previous commitment research and a set of questions was already established, adding to the reliability of the survey. The questionnaire was designed using language that is clear and simple with a clearly laid out format to limit confusion. For each participant surveyed, an adequate amount of time was allowed to ensure the participants were not rushed. Generally, the participants were able to complete the questionnaire during their break between games, before their games began or at the completion of their game set. To increase external validity, the survey was delivered in a 'real life' setting. The student participants were asked to complete the survey about their intramural involvement while they were in the actual environment that they participated in. The survey took place during the program time. This also ensures that the conditions under which the survey was administered were consistent for everyone. Finally, the survey was based on previous research and models including the Sport Commitment Model (Scanlan et al., 1993a) and the Theory of Planned Behaviour (Ajzen, 1988, 1991).

To further test the reliability of the study and add credibility to the results, internal consistency was checked. Internal consistency is the extent to which all the items within a single instrument yield similar results (Salkind, 2004) and this was measured using the Cronbach's Alpha Coefficient for the Sport Commitment Model and the Theory of Planned Behaviour. Deville (2003) recommends that alpha's between .65-.70 are minimally acceptable; between .70-.80, respectable; between .80-.90, very good; and

much above .90, one should consider shortening the scale. Each of the constructs from the Sport Commitment Model had internal validity over .70, making them all acceptable and internally reliable. The overall reliability of the Sport Commitment Model was very good as the alpha score=0.841. In previous studies involving the SCM there were limited studies where all of the constructs were reliable but it did occur (Zahariadis, Tsorbatzoudis & Alexandris, 2006). In most cases different questions within the construct were removed due to low reliability within one or two of the constructs (Weiss & Weiss, 2003; Weiss & Weiss, 2006; Weiss & Weiss, 2007; Scanlan et al, 1993b; Carpenter & Scanlan, 1998). For the purpose of this study none of the questions or constructs were dropped from the study as they were all at least respectably reliable and due to their theoretical relevance to the research questions.

The constructs from the Theory of Planned Behaviour all had an alpha score that was very good except for the Perceived Behavioural Control construct which had an alpha score of 0.62. The overall reliability for the Theory of Planned Behaviour questions was very good (alpha =0.82). In other studies where the TPB was used the Cronbach's alpha was high for each of the constructs (Armitage, 2005; McMillan & Conner, 2003).

Table 1.0

Cronbach's Alpha for each construct in the Sport Commitment Model

Construct	Internal Reliability (alpha > .70)
<i>Sport Commitment</i>	0.79
<i>Sport Enjoyment</i>	0.96
<i>Personal Investments</i>	0.80
<i>Social Constraints</i>	0.73
<i>Involvement Opportunities</i>	0.83
<i>Involvement Alternatives</i>	0.83
<i>Social Support</i>	0.89

*Table 1.1**Cronbach's Alpha for each construct in the Theory of Planned Behaviour*

Construct	Internal Reliability (alpha > .70)
<i>Intentions</i>	0.80
<i>Attitude</i>	0.90
<i>Subjective Norm</i>	0.93
<i>Perceived Behavioural Control</i>	0.62

Treatment of the Data

The study investigated Brock university students and the factors that keep them committed to sport and their intent to continue intramurals, sport, and physical activity pursuits in the future. The survey was coded and inputted into SPSS, version 15/16. Once all the data had been inputted, it was reviewed for accuracy. First, the variable view was visually checked to ensure numbers matched the assigned coding values (i.e., males=1 and females =2) and there are no irrelevant values present. Another measure to check for accuracy of the data was to run frequencies and to obtain the range of values for each variable. This allowed any errors that were missed with the initial visual check to be identified. This helped to identify if there were any out of range numbers, if the values were within range and if the codes had been accurately programmed for missing values (Tabachnick & Fidell, 2007).

Once the data had been screened for accuracy, numerous descriptive statistics were used to summarize the responses to the questions in the survey. The specific descriptive statistics were dependant on the level of measurement of the question and how the responses were distributed. The responses to all of the demographic questions (i.e., age, gender, other sports participated in outside of volleyball, etc...) were

summarized as well as the six constructs of the SCM, including sport commitment, and measures from the TPB.

More specifically, with respect to answering the research questions of this study, the data analysis technique varied depending on each question. The research objectives/questions have been re-stated below followed by a brief description of the data analysis technique that was used to address or answer the objective/question:

1.) *Test the Sport Commitment Model with a sample of post-secondary intramural sport participants.*

Confirmatory Factor Analysis (CFA) is associated with theory testing. CFA is used to determine if the correlations among variables are consistent with the hypothesized factor structure (Tabachnick & Fidell, 2007). As each construct of the Sport Commitment Model is defined by several questions, confirmatory factor analysis was used to determine if all of the questions load on the same constructs and if the scale successfully factor analyzes with post-secondary intramural sport participants. This helped determine which constructs (factors) account for the most variance.

2.) *Determine the utility of the sixth construct, social support, in explaining the sport commitment of post-secondary intramural sport participants.*

Using a regression analysis, there was an examination to determine the amount of additional variance that social support explains in sport commitment as social support is an additional construct added to the model by the researcher. Sport commitment was used as the dependent variable and the remaining SCM constructs were the independent variables. A stepwise regression was used to determine how much (if any) additional variance social support explained.

3.) i.) *Determine if there are any significant differences in the six constructs of the SCM and sport commitment between: gender, level of competition (competitive A vs. B), and number of different intramural sports played.*

Initially this research objective was going to be addressed using multiple analysis of variance (MANOVA) with gender, level of competition and number of different sports played as the independent variables and the six constructs of the SCM and sport commitment as the dependent variables. However, since the data did not meet the assumptions of a MANOVA, multiple t-tests were used to examine gender and level of competition and a correlation was used to determine the relationship between the SCM constructs and the different intramural sports played. It is necessary to meet the assumptions so significant findings can be trusted. To account for the changes made in the type of analysis used, the bonferonni adjustment was applied.

ii.) *Determine if there is a significant interaction effect between gender and level of competition for the six constructs of the SCM and sport commitment.*

Again, the type of analysis used was altered for this research objective. This statement was initially going to be analyzed using a MANOVA examining the interaction effect between gender and level of competition as the independent variables and the six constructs of the SCM and sport commitment as the dependent variables. However, the distribution of males and females in competitive A and competitive B were skewed and the difference in group sizes could effects the accuracy of the findings, stating significant differences where there were none. As a result this research objective was altered and two sets of t-tests were conducted to determine if there was a significant difference between

males and females in competitive A and males and females in competitive B with the constructs of the SCM.

4.) *Determine if there are any significant differences between sport commitment levels and constructs from the theory of planned behaviour (attitudes, subjective norms, perceived behavioural control, and intentions).*

Sport commitment was split into low and high levels (using the median as the dividing point) and then a one-way MANOVA was used to determine if there were any significant differences between the two levels of sport commitment (low vs. high) as the independent variable and the constructs from the TPB as the dependent variables.

5.) *Determine the relationship between sport commitment and intention to: (i) continue participating in intramural volleyball, (ii) continue participating in intramurals, and (iii) continue participating in sports and physical activities after graduation.*

Initially this research objective was going to use correlation where sport commitment was the independent variable and the intention to: (i) continue participating in intramural volleyball, (ii) continue participating in intramurals, and (iii) continue participating in sports and fitness activities after graduation were all the dependent variables. After reviewing the survey the third statement, (iii) “continue participating in sports and fitness activities after graduation” was removed as a variable as the survey did not address this question specifically. The remaining two dependent variables were used in a multiple regression analysis (MANOVA).

6.) *Determine if the level of sport commitment changes the relationship between the constructs from the Theory of Planned Behaviour.*

Two different data sets were created, one with low sport commitment levels and the other with high sport commitment. A regression analysis was run on each data set with attitudes, subjective norms, and perceived behavioural control as the independent variables and intentions as the dependent variable.

In sum, the purpose of this study was to examine the sport commitment of post-secondary intramural sport participants. Students were also asked about their intentions to participate in sport in the future. With the support of the intramural department, the study had access to all the intramural volleyball participants at Brock University. The survey was coded and inputted into SPSS and a variety of statistical tests were used to analyze the collected data.

Chapter 4 - Results

Data Analysis

This survey based study used the Sport Commitment Model (Scanlan et al., 1993a) and the Theory of Planned Behaviour (Ajzen, 1988, 1991) to identify post-secondary students' level of commitment to intramural sports as well as their intent to continue sport participation and physical activity in the future. While the Sport Commitment Model has been used with this demographic, it has never been examined in the intramural sport environment. Examining what drives students to remain committed to sport and physical activity can help identify areas to target in an attempt to increase physical activity levels and prevent the significant drop off in activity levels that increases with age. Also, this study included a sixth construct of social support to the model as a consideration in the research as it relates to this demographic.

The research objectives of this study included; (1.) testing the Sport Commitment Model with a sample of post-secondary intramural sport participants, (2.) determine the utility of the sixth construct, social support, in explaining the sport commitment of post-secondary intramural sport participants, (3.) (i.) determine if there are any significant differences in the six constructs of the SCM and sport commitment between gender, level of competition (competitive A vs. B), and the number of different intramural sports played, (ii.) determine if there is a significant interaction between gender and level of competition for the six constructs of the SCM and sport commitment, (4.) determine if there are any significant differences between sport commitment levels and constructs for the theory of planned behaviour (attitudes, subjective norms, perceived behavioural control, and intentions), (5.) determine the relationship between sport commitment and

intention to continue participation in intramural volleyball, continue participating in intramurals and continuing participating in sport and physical activity after graduation, and (6.) determine if the level of sport commitment changes the relationship between the constructs from the Theory of Planned Behaviour.

Data Screening

Prior to conducting the data analysis some steps were taken to screen the data and eliminate data that could not be used in the study. Prior to any data input, surveys that did not include a signature on the informed consent page were not included in the data set, as specified in the study ethics application. If it appeared the survey had been rushed, or if the answers had all been circled the same (ie. only the number 3 is circled all through the survey or a long circle was put around the answers in each section) then the survey was eliminated. This would imply that the participant had not read the questions in the survey and considered a thoughtful response. The questionnaire was written on both sides of the page so if someone did not review the pages carefully they could miss a full page of questions. When an entire page was skipped the questionnaire included too much missing data and was not used. It was important to not compromise statistical power or the generalizability of the results.

Once all the data was entered into SPSS all of the questions were run through frequency and descriptive tests to determine if there were any outliers. In the event that outliers were detected (ie. when results could only be a 1 or a 0 and a 2 appeared, or when the scale ranged from 1 to 5 and there was a response of 43) the proper corrections were made, as these were data entry errors and could provide inaccurate results. The volume of missing data was not large, although one Sport Commitment question was missing 38

cases, but still left 264 usable responses. Since there are no firm guidelines for how much missing data can be tolerated based on a given sample size (Tabachnik & Fidell, 2007) the results were still included and used, despite the pattern of missing data from the Sport Commitment construct section of the survey.

Background Demographics

Of the 318 surveys distributed, there were 302 participants who completed a usable survey from the sample of post-secondary intramural sport participants at Brock University. Roughly fifty-two percent of the participants were male (N=156) and forty-eight percent of the participants were female (N=146). The average age of the participants was 21 years (M = 21.08, SD = 2.306). Seventeen percent of the students reported that they were in their first year of study (N=51), 25% were in second (N=74), 23% were in third (N=68), 25% were in fourth (N=75), 5% were in their fifth year or higher (N=15), and 6% indicated they were studying at the graduate level (N=18). Overall, the majority of the students who participated in the survey were undergraduate students (N=268, 89%) while the remaining participants reported being in their fifth year or higher or graduate studies (N=33, 11%). The majority of the students participated in the competitive B division (N=238), making up 80% of the participants in the volleyball program, while the remainder of the participants (N=61) were active in the competitive A division. The students also indicated the total number of intramural sports they participated in throughout the school year. The students who only participated in intramural volleyball represented 26.5% (N=80) of the sample. Those students who participated in two intramural sports represented 32.1% (N=97), 19.9% (N=60) participated in three sports, 10.3% (N=31) participated in four sports and 11.3% (N=34)

participated in five or more intramural sports throughout the academic school year (Refer to Table 2.0 below for results).

Table 2.0

Background Demographics

Characteristic	<u>N</u>	%
<i>Gender</i>		
Male	156	51.7
Female	146	48.3
<i>Age (years)</i>		
17-18	21	7.1
19	40	13.2
20	70	23.2
21	68	22.5
22	41	13.6
23	29	9.6
24-37	26	8.8
<i>Year of Study</i>		
First	51	16.9
Second	74	24.6
Third	68	22.6
Fourth	75	24.9
Fifth yr or higher	15	5.0
Graduate Studies	18	6.0
<i>Level of Competition</i>		
Competitive A	61	20.4
Competitive B	238	89.6
<i>Number of Intramural Sports Played</i>		
1 (volleyball)	80	26.5
2	97	32.1
3	60	19.9
4	31	10.3
5 or more	34	11.3

Demographic Characteristics of Participants (N=302)

The Sport Commitment Model

The majority of the participants felt that they have a high level of dedication to playing on their intramural team ($M=4.27$, $SD=0.86$) but that they would still have a fairly easy time quitting ($M=3.76$). The distribution for the question “*How determined are you to keep playing on intramurals?*” was very peaked. It is not surprising that each of the skewness scores was negative as the participants generally had a positive commitment to intramurals (refer to Table 2.1 below for results).

Table 2.1

Mean scores of Sport Commitment Questions

Questions	<u>M</u>	<u>SD</u>	Skewness	Kurtosis
How dedicated are you to playing on an intramural team?*	4.27	0.86	-1.31	1.95
How difficult would it be for you to quit your intramural team?*	3.76	1.22	-0.73	-0.36
How determined are you to keep playing on intramurals?*	4.31	0.84	-1.42	2.51
What would you be willing to do to keep playing intramurals? **	3.83	0.99	-0.45	-0.43

*Measured on a 5-point Likert scale ranging from 1= ‘not at all dedicated’ to 5= ‘very dedicated.’

**Measured on a 5-point Likert scale ranging from 1= ‘nothing at all’ to 5= ‘a lot of things.’

On average, all of the scores in the ‘Sport Enjoyment’ construct were high, with small standard deviation scores, indicating enjoyment plays a large part in keeping students committed to intramural sports. This was consistent with the negatively skewed scores and the high kurtosis values (refer to Table 2.2 below for results).

Table 2.2

Mean Scores for Sport Enjoyment Questions

Questions	<u>M</u>	<u>SD</u>	Skewness	Kurtosis
Do you enjoy playing intramural sports this semester?	4.65	0.63	-2.08	5.40
Are you happy playing intramurals this semester?	4.64	0.63	-2.00	5.09
Do you have fun playing intramurals this semester?	4.66	0.62	-2.20	6.50
Do you like playing intramurals this semester?	4.67	0.63	-2.38	7.12

Measured on a 5-point Likert scale ranging from 1= 'not at all' to 5= 'very much.'

The mean scores for 'Personal Investments' were fairly consistent. The questions concerning the amount of time put into intramurals (skewness=0.19) and how much money was put into intramural participation (skewness=0.14) each had a relatively normal distribution (refer to Table 2.3 below for results).

Table 2.3

Mean Scores for Personal Investments Questions

Questions	<u>M</u>	<u>SD</u>	Skewness	Kurtosis
How much of your time have you put into intramurals this semester?	3.22	0.89	0.19	-0.52
How much effort have you put into playing intramurals this semester?	3.71	0.96	-0.43	-0.36
How much of your own money have you put into playing in intramurals this semester of things like fees and equipment?	3.01	1.24	0.14	-0.92
How much energy have you put into intramurals this semester?	3.70	0.94	-0.40	-0.37

Measured on a 5-point Likert scale ranging from 1= 'none' to 5= 'very much.'

The 'Social Constraints' construct had the second lowest mean scores. The lowest social constraint was '*I feel I have to play intramurals to please others*'; which was not how the intramural participants felt (M=1.60). This question also had a low standard deviation, so there was not much variation in the responses (SD=0.99). For these

responses, it appears students do not feel social pressure from outside influences to participate in intramurals (refer to Table 2.4 on the next page for results).

Students reported that they would miss the good times they have playing intramurals if they were to discontinue their participation ($M=4.07$, $SD=1.02$). Overall the results in the ‘Involvement Opportunities’ section are fairly consistent (refer to Table 2.5 on the next page for results).

Table 2.4

Mean Scores for Social Constraints Questions

Questions	<u>M</u>	<u>SD</u>	Skewness	Kurtosis
I feel I have to play in intramurals so I can be with my friends.	2.42	1.31	0.42	-1.01
I feel I have to play intramurals to please others.	1.60	0.99	1.64	1.89
People will be disappointed in me if I quit intramurals.	3.00	1.46	-0.04	-1.36
People will think I’m a quitter if I stop participating in intramurals.	2.59	1.46	0.37	-1.28

Measured on a 5-point Likert scale ranging from 1= ‘not at all how I feel’ to 5= ‘very much how I feel.’

Table 2.5

Mean Scores for Involvement Opportunities Questions

Questions	<u>M</u>	<u>SD</u>	Skewness	Kurtosis
Would you miss your friends in intramurals if you left?	3.44	1.26	-0.48	-0.72
Would you miss being an intramural participant if you left intramurals?	3.96	1.09	-0.98	0.36
Would you miss the good times you have had playing intramurals this semester if you left intramurals?	4.07	1.02	-1.04	0.50

Measured on a 5-point Likert scale ranging from 1= ‘not at all’ to 5= ‘very much.’

‘Involvement Alternatives’ have the lowest reported mean scores compared to all the Sport Commitment Constructs. This is the only construct in the SCM that has a negative influence on sport commitment. Based on the low scores it appears intramural participants do not consider other options more appealing than participating in

intramurals. If the mean scores were higher it would indicate that the students had found other ways to spend their time and would prefer to participate in the alternative activities instead of spending their time pursuing intramurals (refer to Table 2.6 on the next page for results).

Table 2.6

Mean Scores for Involvement Alternatives Questions

Questions	<u>M</u>	<u>SD</u>	Skewness	Kurtosis
Compared to participating in intramurals, there are other things I could do which would be more fun.	2.53	1.09	0.33	-0.51
Compared to participating in intramurals, there are other things I could do which would be more enjoyable.	2.42	1.01	0.34	-0.47
Compared to participating in intramurals, there are other things I could do which would be more worthwhile.	2.61	1.17	0.19	-0.80
I would be happier doing something else instead of participating in intramurals.	1.89	1.01	0.94	0.02
I would like to be doing something else instead of participating in intramurals.	1.75	1.00	1.35	1.26

Measured on a 5-point Likert scale ranging from 1= 'not at all how I feel' to 5= 'very much how I feel.'

While 'Social Support' was not part of the original SCM, it has recently been added as a sixth determinant in sport commitment research. The high mean scores indicate social support from peers positively influences the students to participate in intramurals (refer to Table 2.7 below for results).

Table 2.7

Mean Scores for Social Support Questions

Questions	<u>M</u>	<u>SD</u>	Skewness	Kurtosis
People important to me support my intramural participation.	3.96	1.11	-1.01	0.36
People important to me think it is okay to participate in intramurals.	4.26	0.95	-1.36	1.59
People important to me encourage me to participate in intramurals.	4.10	1.08	-1.15	0.64

Measured on a 5-point Likert scale ranging from 1= 'not at all how I feel' to 5= 'very much how I feel.'

Based on the scores of all the sport commitment constructs, students identified sport enjoyment (93.1%), involvement opportunities (76.5%) and social support (82.2%) as the most important factors which contributed to their overall commitment to intramural sports. Social constraints (48.0%) and involvement alternatives (44.5%) are the constructs with the lowest scores (refer to Table 2.8 on the next page for results).

Table 2.8

Mean and standard deviation of the Sport Commitment constructs

Constructs	<u>M</u>	Max Value	<u>SD</u>	% (<u>M</u> / max value)
Sport Commitment	16.16	20.0	3.11	80.8
Sport Enjoyment	18.61	20.0	2.35	93.1
Personal Investment	13.64	20.0	3.21	68.2
Social Constraints	9.59	20.0	3.91	48.0
Involvement Opportunities	11.48	15.0	2.91	76.5
Involvement Alternatives	11.13	25.0	4.05	44.5
Social Support	12.33	15.0	2.84	82.2

Note: Each question was based on a 5-point Likert scale. Each construct has between 3 to 5 questions which are reflected in the 'Maximum Value' column. Divide the max value by 5 to determine the number of questions measured in the construct.

The Theory of Planned Behaviour

Based on the mean scores reported, the students have a lasting intent to continue participating in intramurals and other sports and physical activities in the future. The standard deviation scores are all within less than one point which demonstrates there is small variability in the responses (refer to Table 2.9 below for results).

Table 2.9

Mean Scores for Intentions Questions - (Current and Future Participation)

Questions	<u>M</u>	<u>SD</u>	Skewness	Kurtosis
I intend to participate in intramural volleyball on a regular basis (*).	4.39	0.95	-1.51	1.58
I will make an effort to attend intramural volleyball games regularly (**).	4.45	0.93	-1.79	2.75
I will make an effort to continue participating in intramurals or other sports and physical activities in the future (*).	4.54	0.76	-1.91	4.25
I intend to participate in intramurals or other sports and physical activities in the future (**).	4.59	0.76	-2.09	4.77

Measured on a 5-point Likert scale ranging from 1= 'strongly disagree' to 5= 'strongly agree'* and 1= 'I definitely will not' to 5= 'I definitely will.'**

Based on the five point semantic differential scale, the higher results indicated a more positive perception of the 'Attitudes' towards participating in intramurals regularly for the upcoming month. For each of the attitude scales, there was a high mean score, as well; the skew scores were all negative, indicating high scores (refer to Table 2.10 below for results).

Table 2.10

Mean Scores for Attitude Questions - (TPB)

Questions	<u>M</u>	<u>SD</u>	Skewness	Kurtosis
1= harmful to 5=beneficial	4.55	0.81	-2.48	7.24
1=foolish to 5=wise	4.34	0.95	-1.61	2.52
1=not enjoyable to 5=enjoyable	4.60	0.86	-2.69	7.35
1=unpleasant to 5=pleasant	4.58	0.88	-2.65	7.19

5-point Likert Scale for each question.

The 'Subjective Norms' questions measured students' perceived social pressure to engage or not engage in intramurals. Again, the mean scores were high and the skewness was negative, indicating a strong presence of subjective norms (refer to Table 2.11 below for results).

Table 2.11

Mean Scores for Subjective Norm Questions - (TPB)

Questions	<u>M</u>	<u>SD</u>	Skewness	Kurtosis
I expect to participate in intramurals.	4.48	0.85	-1.65	2.39
I intend to participate in intramurals.	4.55	0.76	-1.63	2.12
I want to participate in intramurals.	4.62	0.71	-1.97	3.70

Measured on a 5-point Likert scale ranging from 1= 'not at all' to 5= 'every week.'

From all the constructs in the Theory of Planned Behaviour, 'Perceived Behavioural Control' (PBC) had the lowest mean scores. The lowest average score occurred for the statement "*I feel under social pressure to participate in intramurals*". This statement also had the highest standard deviation, indicating a wider range of responses (M=2.33, SD=1.18). This indicates some students feel more social pressure than others to participate. The highest PBC score was for the statement "the decision to play is easy" (M=4.49) (refer to Table 2.12 on the next page for results).

Table 2.12

Mean Scores for Perceived Behavioural Control - (TPB)

Questions	<u>M</u>	<u>SD</u>	Skewness	Kurtosis
Most people who are important to me think that I should participate in intramurals.	3.95	0.96	-0.99	1.13
It is expected of me that I should participate in intramurals.	3.34	1.18	-0.33	-0.76
I feel under social pressure to participate in intramurals.	2.33	1.18	0.53	-0.73
People who are important to me want me to participate in intramurals.	3.69	1.05	-0.83	0.41
I am confident that I could participate in intramurals if I wanted to.	4.45	0.74	-1.54	3.35
For me, to participate in intramurals is easy.	4.36	0.79	-1.49	3.17
The decision to participate is easy.	4.49	0.77	-1.83	4.30
Whether I participate in intramurals or not is entirely up to me.	3.94	1.41	-1.17	-0.05

Measured on a 5-point Likert scale ranging from 1= 'strongly disagree' to 5= 'strongly agree.'

Overall, each of the constructs in the Theory of Planned Behaviour (TPB) had high results. Subjective Norms (89.9%) and Intentions (89.7%) had equal results. Perceived Behavioural Control (75.8%) had the lowest scores with the greatest standard deviation (refer to Table 2.13 below for results).

Table 2.13

Mean and standard deviation of the Theory of Planned Behaviour Variables

Constructs	M	Max Value	SD	% (M/max)
Intention	17.93	20.0	2.71	89.7
Attitude	17.78	20.0	3.55	88.9
Subjective Norm	13.48	15.0	2.55	89.9
Perceived Behavioural Control	30.33	40.0	4.74	75.8

Note: Each question was based on a 5-point Likert scale. There are 4 questions in the Intention and Attitude sections, there are 3 questions in the Subjective Norms section and 8 questions in the Perceived Behavioural Control section and these values are reflected in the 'Maximum Value' column.

Research Objectives

Objective 1: *Test the Sport Commitment Model with a sample of post-secondary intramural sport participants.*

As the Sport Commitment Model has not been used in the post-secondary intramural environment, a confirmatory factor analysis (CFA) was conducted to determine how well the model fit the sample. The CFA used the questions that directly related to the six constructs and the sport commitment construct. Each construct had three to five questions each and each item significantly loaded on its corresponding factor.

According to the comparative fit index (CFI), values greater than .95 demonstrate a good-fitting model (Tabachnick & Fidell, 2007). The CFI value for this data set was .841, making it too low to be a good fit. With the standardized root mean square residual (SRMS), a small value indicates a good-fitting model where values of .08 or less are favoured (Tabachnick & Fidell). With this data set the SRMS was .197 making it too

high to be a good-fitting model. The root mean square error of approximation (RMSEA), “estimates the lack of fit in a model compared to a perfect (saturated) model”

(Tabachnick & Fidell, p. 717). For the RMSEA a value of .06 or less indicates a good-fitting model and values larger than .10 represent a poor-fitting model. For the RMSEA test this data set was .089, providing weak support for the model with the data set. These three most accepted comparative fit approaches show that the Sport Commitment Model is not a good fit for the sample; there is enough support to state that this data does not fit the model.

Objective 2: *Determine the utility of the sixth construct, social support, in explaining the sport commitment of post-secondary intramural sport participants.*

Assumptions of Regression

According to Tabachnick and Fidell (2007), before findings from the test can be generalized the following assumptions must be met when using multiple regression; there is an absence of multicollinearity, that errors of prediction are independent of one another, and that normality, linearity, and homoscedasticity are assessed. The first assumption check is to determine that there is no perfect multicollinearity. The intent is to avoid a correlation coefficient of one (Field, 2005). With this analysis, there is no perfect linearity between the sport commitment construct and the remaining SCM constructs. The second assumption that was checked is the assumption of independent errors. The Durbin-Watson value was checked to determine if the residuals were independent where the values should land between one and three and the closer to two the value is, the more reliable it is (Field). The Durbin-Watson value for this analysis was 0.885. The assumption of independent error was not met for this test. The Durbin-Watson statistic

was outside the acceptable range and this violates the assumption of independence and could reflect the violation of a function of something (ie. time in the season when the questionnaire was completed) with the order of cases (Tabachnick & Fidell, 2007). The next assumption to be met involved checking the linearity and the heteroscedasticity of the data. Overall, the increments of the predictors lie along a straight line and the scatter plots for the intentions were fairly randomly and evenly distributed throughout the plot indicating a situation where the assumptions of linearity and homoscedasticity have been met. The final assumption is that the variable has a normal distribution. This analysis had a slightly skewed distribution. Overall, all of the assumptions for multiple regression were met with the exception of the assumption of independence and normality (see appendix C for the assumption tables).

Analysis

In a hierarchical regression analysis Sport Commitment was used as the outcome or dependent variable and the remaining constructs of the Sport Commitment Model were the predictors or independent variables. With the hierarchical regression the original SCM constructs were added in the model and the regression analysis was run. These were initially used as they have been tested and there is theoretical grounding to support the constructs. This was followed by running a second analysis where social support was added to the list of independent variables to determine if it was a predictor in explaining the sport commitment of post secondary intramural sport participants. In the initial model, the overall R^2 value was .392 (refer to Table 3.1 for the results of the two models). This indicated that the first model accounted for 39% of the variance in sport commitment. Sport enjoyment ($t=5.72$, $\beta=.31$, $p<.001$), personal investments ($t=5.49$,

$\beta=.30, p<.001$) and involvement opportunities ($t=2.37, \beta=.14, p<.05$) were the significant predictor variables in the first model for the regression analysis.

In the second model, the overall R^2 value stayed the same at .392. This indicates that the model still only accounted for 39% of the variance in sport commitment with the addition of the social support construct. Therefore, it can be stated that social support did not explain any additional variance and was not a significant predictor variable in the sport commitment of post-secondary intramural sport participants. Sport enjoyment ($t=5.53, \beta=.31, p<.001$), personal investments ($t=5.46, \beta=.30, p<.001$), and involvement opportunities ($t=2.75, \beta=.12, p=.05$) were still the significant predictors of sport commitment.

Table 3.0

Means, Standard Deviations, and Correlations for Sport Commitment and the SC Constructs

Variables	<u>M</u>	<u>SD</u>	1	2	3	4	5	6
Sport Commitment	15.52	3.44	.53	.51	.10	.48	-.21	.31
1. Sport Enjoyment	18.61	2.35	--	.42	.04	.52	-.27	.36
2. Personal Investments	13.63	3.21		--	.15	.52	-.09	.30
3. Social Constraints	9.58	3.91			--	.14	.18	.14
4. Involvement Opportunity	11.48	2.91				--	-.26	.48
5. Involvement Alternatives	11.16	4.06					--	-.07
6. Social Support	12.25	3.01			1			--

Table 3.1

Regression Analysis Summary using the Sport Commitment Constructs to Predict Sport Commitment (Hierarchical Models)

Model 1

Variable	<u>B</u>	<u>SEB</u>	<u>T</u>	<u>β</u>
Sport Enjoyment	.46	.08	5.72	.31**
Personal Investment	.32	.06	5.49	.30**
Social Constraints	.03	.04	0.81	.04
Involvement Opportunities	.16	.07	2.37	.14*
Involvement Alternatives	-.06	.04	-1.36	-.07

Note: $R^2 = .392$ (N=302)

* $p < .05$, ** $p < .001$

Model 2

Variable	<u>B</u>	<u>SEB</u>	<u>T</u>	<u>β</u>
Sport Enjoyment	.45	.08	5.53	.31**
Personal Investments	.32	.06	5.46	.30**
Social Constraints	.03	.04	0.75	.04
Involvement Opportunities	.14	.07	1.97	.12*
Involvement Alternatives	-.06	.04	-1.42	-.07
Social Support	.05	.06	0.81	.04

Note: $R^2 = .392$ (N=302)

* $p < .05$, ** $p < .001$

Objective 3: (i.) Determine if there are any significant differences in the six constructs of the SCM and sport commitment between: gender, level of competition (competitive A vs. B), and number of different intramural sports played.¹

Assumptions

With a t-test there are several assumptions that must be met. The first assumption is that the sample must be drawn from a population that is normally distributed. Overall, each of the distributions for the different sport commitment constructs were fairly normally distributed. The skewness and kurtosis of each construct was approximately

zero. The few exceptions were Sport Enjoyment (skewness = -2.18, kurtosis = 6.58) and Social Support (skewness = -1.31, kurtosis = 1.88). The second assumption is that the sample is drawn at random from the population. This assumption was not violated as the method for collecting data was census sampling and every participant in the volleyball intramural program had an opportunity to participate if they were interested. The third assumption is that the variance of the two samples should be approximately equal. This was tested with Levene's statistic for both the t-test with gender or level of competition and the sport commitment constructs; equal variance was not assumed as Levene's statistic was $p < .05$. Therefore, results for the t-test were reported with equal variance not assumed. The fourth assumption is that the data must be interval or ratio. Assumption four was met as the sport commitment constructs had no natural zero point and the distance between the values was equal.

Analysis

To determine if any significant differences are present with gender and the six constructs of the SCM and sport commitment, t-tests were conducted. While this was originally proposed as a MANOVA, it is reasonable to use a t-test instead. The idea of a MANOVA is that it protects against inflated Type I error rates because the initial test is non-significant. However, the follow-up ANOVA's are carried out to determine where the significant difference is applied (Field, 2005). The MANOVA protects only the dependent variables for where differences truly exist therefore a Bonferroni correction can be applied to the ANOVAs. While a MANOVA offers protection against familywise Type I error, a Bonferroni adjustment can be applied to each test to control the error rate (Tabachnick & Fidell, 2007). As a result of the multiple t-tests, a Bonferroni type

adjustment was made because of the inflated Type I error. The Bonferroni adjustment is based on the error rate for testing all of the times the dependent variables are used (Tabachnick & Fidell). As a result of using the same dependent variables (SCM constructs) in four different analyses the Bonferroni adjustment was set at $p \leq .0125$ [$p=0.05$ divided by 4 (number of t-tests performed per construct) = 0.0125]. Based on the results, it can be stated that there are no significant differences between males and females and the six constructs of the SCM and sport commitment (results are outlined in Table 3.2).

Table 3.2

Gender and SCM constructs and Sport Commitment (t-test)

Construct	Mean Score		t-value	Sig.
	Male	Female		
Sport Commitment	15.74	15.29	1.15	.25
Sport Enjoyment	18.59	18.63	-.13	.90
Personal Investments	13.67	13.59	.21	.83
Social Constraints	9.72	9.44	.62	.54
Involvement Opportunities	11.30	11.66	-1.08	.28
Involvement Alternatives	11.53	10.75	1.67	.10
Social Support	11.88	12.63	-2.17	.03

N= 302. Mean score is based on several questions per construct each based on a 5-point Likert Scale (Max Mean scores for each construct: Sport Commitment=20, SE=20, PI=20, Social Constraint=20, IO=15, IA=25 and SS=15.)

$p \leq .0125$

Analysis

1

There was a separate t-test conducted to determine if any significant differences existed in the Sport Commitment constructs and the participants in the Competitive A division and those participating in the Competitive B division. The difficulty was that there was a large difference in the number of participants in each division (competitive A = 61, competitive B = 238). These unequal groups are a reflection of the population and

the differences are simply a reflection of this, so it would not be appropriate to delete cases. It is acceptable to have different sample sizes as long as the heterogeneity of variance is checked (Tabachnick & Fidell, 2007). It was still important to be cautious of Type I error. The Bonferroni adjustment was used again and set at $p \leq .0125$ [$p = 0.05$ divided by 4 (number of t-tests performed per constructs) = 0.0125]. The t-test results indicated that at the $p \leq .0125$ level there were no significant differences between the competitive A division and the competitive B division and the six constructs of the SCM and sport commitment (results are outlined in Table 3.3).

Table 3.3

Level of Competition (A or B) and SCM constructs and Sport Commitment (t-test)

Construct	Mean Score		t-value	Sig.
	Comp A	Comp B		
Sport Commitment	15.39	15.56	-.33	.74
Sport Enjoyment	18.23	18.71	-1.39	.17
Personal Investments	13.95	13.54	.87	.39
Social Constraints	10.41	9.33	1.81	.07
Involvement Opportunities	11.69	11.44	.60	.55
Involvement Alternatives	11.56	11.01	.87	.39
Social Support	12.13	12.30	-.38	.70

N= 299. Mean score is based on several question per construct each based on a 5-point Likert Scale (Max Mean scores for each construct: Sport Commitment=20, SE=20, PI=20, Social Constraint=20, IO=15, IA=25 and SS=15).

A t-test could not be used to determine if a significant difference existed between the total number of intramural sports participated in and the constructs of the SCM and as a result correlation was used to determine if there was a significant relationship between the number of intramural sports played and the six constructs of the SCM and sport commitment. The results indicated that sport commitment, sport enjoyment, personal investments and involvement opportunities have a positive, significant relationship with the frequency of intramural sport participation.

There was a significant, positive relationship between the number of sports played and sport commitment ($R=.231$, $df=300$, $p=.000$). This implies that the more intramural sports a student participates in, the higher their sport commitment is. More specifically, the number of intramural sports participated in accounts for 5.3% ($R^2=0.0534$) of the variance in sport commitment. There was a significant, positive relationship with the total number of intramural sports played and sport enjoyment ($R=.120$, $df=300$, $p=.037$). The more intramural sports that subjects participated in the higher they rated their level of sport enjoyment ($R^2=.0144$). Personal investment also had a significant, positive relationship with the number of intramural sports a student participated in ($R=.282$, $df=300$, $p=.000$). The number of intramural sports participated in accounts for 8% ($R^2=.0795$) of the variance in personal investment. Finally, involvement opportunities was the final construct that had a positive, significant relationship with the total number of intramural sports participated in ($R=.132$, $df=300$, $p=.022$). This implies that the more intramural sports a student participated in, the higher they rated the value placed on involvement opportunities ($R^2=0.0174$) (results are outlined in Table 3.4).

While sport commitment, sport enjoyment, personal investments, and involvement opportunities were all positively correlated with the total number of sports participated in, the strength of those relationships were weak. The only construct to have a negative relationship (albeit not significant) with the number of intramural sports participated in was involvement alternatives. This was expected as involvement alternatives were the only construct in the Sport Commitment Model that has a negative influence on commitment to sport.

Table 3.4

Pearson Correlation between Number of Intramural Sports Played and the Sport Commitment Constructs

Measure	1	2	3	4	5	6	7	8
1. Total Sports Played	--	.231**	.120*	.282**	.003	.132*	-.070	.114*
2. Sport Commitment		--	.530**	.514**	.100	.479**	-.205**	.311**
3. Sport Enjoyment			--	.424**	.037	.520**	-.265**	.360**
4. Personal Investments				--	.149**	.521**	-.089	.303**
5. Social Constraints					--	.135*	.184**	.138*
6. Involvement Opportunity						--	-.264**	.482**
7. Involvement Alternatives							--	-.068
8. Social Support								--

** Correlation is significant at the 0.01 level.

* Correlation is significant at the 0.05 level.

Objective 3. ii.) *Determine if there is a significant interaction effect between gender and level of competition for the six constructs of the SCM and sport commitment.*

It was evident that the number of participants in the Competitive A and Competitive B divisions varied greatly, as the competitive A division was considerably smaller (comp A = 61 or 20.4%, comp B = 238 or 79.6%). Since the volleyball league was co-ed, the number of males and females in each division was similar. However, the distribution of males and females in competitive A and competitive B are skewed. It would be difficult to examine the interaction effect of the 30 males in competitive A with the 124 males in competitive B. Likewise; the difference of 31 to 114 females in the two divisions is also skewed (see Table 3.5 below). The difference in group sizes will therefore affect the accuracy of the findings, stating significant differences where there are none.

Table 3.5

Gender and Level of Competition

	Competitive A	Competitive B
Males	30	124
Females	31	114

However, it is still possible to examine the effect between males and females in the competitive A ($m=30, f=31$) division and examine the relationship of males and females in competitive B ($m=124, f=114$). This effect is easier to explore as the group sizes are very similar. Instead of using a MANOVA as originally proposed where the assumptions were not met, the sample was separated by the level of competition and males and females were compared within each level of competition using multiple t-tests.

Assumptions

The first assumption is that the sample must be drawn from a population that is normally distributed. Overall, each of the distributions for the different sport commitment constructs were fairly normally distributed. The skewness and kurtosis of each construct were approximately zero. The exceptions were the same as indicated in the previously t-test; the few exceptions were Sport Enjoyment (skewness = -2.18, kurtosis = 6.58) and Social Support (skewness = -1.31, kurtosis = 1.88). The second assumption is that the sample is drawn at random from the population. This assumption was not violated as the method for collecting data was census sampling. The third assumption is the homogeneity of variance assumption which is checked using Levene's Test for Equality of Variances. With both of the t-tests looking at the separate level of competition and gender with the SCM constructs, equal variance was assumed as Levene's statistic was $p > .05$ for all t-tests conducted comparing males to females in both competitive A and B. Therefore,

results for both data sets were reported with equal variances assumed. The fourth assumption is that the data must be interval or ratio. Assumption four was met as the sport commitment constructs had no natural zero point and the distance between the values was equal.

Analysis

To determine if any significant differences are present with males and females in the competitive A division and the six constructs of the SCM and sport commitment, a t-test was completed. While this was originally proposed as a MANOVA, it is reasonable to use a t-test instead. While a MANOVA offers protection against familywise Type I error, a Bonferroni adjustment can be applied to each test to control the error rate (Tabachnick & Fidell, 2007). As a result of the multiple t-tests, a Bonferroni type adjustment was made because of the inflated Type I error. Having used the same variables in the previous two t-tests, the Bonferroni adjustment was set at $p \leq .0125$ [$p=0.05$ divided by 4 (number of t-tests performed per construct) = 0.0125]. Based on the results, it can be stated that there are no significant differences between males and females in the competitive A division and the six constructs of the SCM and sport commitment (see Table 3.6).

Table 3.6

Competitive A - Gender and SCM constructs and Sport Commitment

Construct	Mean Score		t-value	Sig.
	Male	Female		
Sport Commitment	15.40	15.39	0.01	0.99
Sport Enjoyment	18.23	18.23	0.01	0.99
Personal Investments	13.83	14.06	-0.27	0.79
Social Constraints	10.43	10.49	0.04	0.97
Involvement Opportunities	12.10	11.29	1.08	0.28
Involvement Alternatives	11.30	11.81	-0.44	0.66
Social Support	11.97	12.29	-0.40	0.69

N= 302. Mean score is based on several questions per construct each based on a 5-point Likert Scale (Max Mean scores for each construct: Sport Commitment=20, SE=20, PI=20, Social Constraint=20, IO=15, IA=25 and SS=15.)

$p \leq .0125$

Analysis

There was a separate set of t-tests conducted to determine if any significant differences existed in the Sport Commitment constructs and the male and female participants in the Competitive B division. Again, it was still important to be cautious of Type I error so the Bonferroni adjustment was used again and set at $p \leq .0125$ [$p=0.05$ divided by 4 (number of t-tests performed per constructs) = 0.0125]. The t-test results indicated that at the $p \leq .0125$ level there were no significant differences between the males and females in the competitive B division and the six constructs of the SCM and sport commitment (see Table 3.7 for results).

Table 3.7

Competitive B - Gender and SCM constructs and Sport Commitment

Construct	Mean Score		t-value	Sig.
	Male	Female		
Sport Commitment	15.79	15.31	1.08	0.28
Sport Enjoyment	18.66	18.76	-0.34	0.74
Personal Investments	13.60	13.47	0.32	0.75
Social Constraints	9.49	9.15	0.70	0.49
Involvement Opportunities	11.14	11.76	-1.66	0.10
Involvement Alternatives	11.56	10.40	2.29	0.02
Social Support	11.90	12.74	-2.17	0.03

N= 299. Mean score is based on several question per construct each based on a 5-point Likert Scale (Max Mean scores for each construct: Sport Commitment=20, SE=20, PI=20, Social Constraint=20, IO=15, IA=25 and SS=15).

$p \leq .0125$

Objective 4: *Determine if there are any significant differences between sport commitment levels and constructs from the theory of planned behaviour (attitude, subjective norm, perceived behavioural control, and intention).*

A MANOVA was conducted to determine if there was a significant difference between those who reported high sport commitment levels and those who had low sport commitment with the constructs from the theory of planned behaviour (TPB). Sport Commitment was separated into high and low where the median of 16 was used as the dividing point and anyone with an overall score of 15 or less was classified as low sport commitment and with a score of 17 to 20 were high sport commitment. The median, as opposed to the mean, was used to separate the high and low sport commitment groups as the distribution was skewed for the sport commitment construct. There were 148 students with low sport commitment levels and 128 students reported high levels of sport commitment. The dependent variables were the TPB constructs including intention,

attitude, subjective norm and perceived behavioural control. Refer to Table 3.8 for their means and standard deviations.

Table 3.8

Mean Scores for High and Low Sport Commitment Levels on the Theory of Planned Behaviour Categories

	<u>M</u>	Maximum Value	<u>SD</u>
<i>Intention</i>			
<i>Low SC</i>	16.80	20.0	3.13
<i>High SC</i>	19.06	20.0	1.52
<i>Attitude</i>			
<i>Low SC</i>	16.67	20.0	4.02
<i>High SC</i>	18.89	20.0	2.70
<i>Subjective Norm</i>			
<i>Low SC</i>	12.55	15.0	3.01
<i>High SC</i>	14.43	15.0	1.52
<i>Perceived Behavioural Control</i>			
<i>Low SC</i>	29.31	40.0	4.58
<i>High SC</i>	31.36	40.0	4.90

Assumptions

According to Tabachnick and Fidell (2007) the assumptions for a MANOVA are homogeneity of variance-covariance, multivariate normality and linearity. The results of the MANOVA indicated that the assumptions were not all met. For the Homogeneity of variance, The Box's test of equality indicated a significance level of ($p < .05$). However, this statistic should be non-significant to indicate that the assumption of homogeneity has been met (Field, 2005). Since the value of the Box's test was significant ($p < .05$) the covariance matrices are significantly different and the homogeneity assumption has been violated. However, the effects of violating this assumption are unclear (Field). Because Box's test can be unstable, if the sample sizes are relatively equal it is acceptable to disregard Box's test. As Hair et al. (2006) stated, a violation of this assumption has

minimal impact if the groups are approximately equal in size. This is determined by dividing the largest group size by the smallest group size and having a difference of less than 1.5 (Hair et al.). For the case of high and low sport commitment, the difference is less than 1.5 ($148/128=1.156$), so the violation of the Box's Test can be disregarded.

Each of the criteria used to assess the multivariate differences across groups (Pillai's Trace, Wilks' Lambda, Hotelling's Trace and Roy's Largest Root) produced a significance of $p<.05$. As the difference in sample sizes was relatively similar, it is acceptable to trust the results of Pillai's trace (Field, 2005). Pillai's trace is one of the measures that is most immune to violations of the assumptions underlying MANOVA (Hair, Black, Babin, Anderson & Tatham, 2006). Evidence suggests Pillai's trace is more robust and should be used if homogeneity of covariance is violated (Hair et al.). With this MANOVA, Levene's Test of Equality of variance produced significant results for each of the dependent variables (for this case, these include the TPB constructs) indicating the assumptions of homogeneity of variance had not been met (Field, 2005). This further supports the use of Pillai's trace as the criteria to assess the multivariate differences across groups, as Hair et al. state there is evidence to suggest Pillai's criterion should be used when homogeneity of covariance is violated.

The assumption of normality was checked by examining the normality of the constructs in the TPB. In this case, each of the TPB constructs had a slightly skewed curve. However, the impact of violating this assumption has minimal impact when the sample size is large. Also, the violations can be accommodated as they are due to the skewness (Hair et al., 2006).

Analysis

To test the probability of not committing a Type II error, the power was calculated. The Power score was 1.0 which indicates less chance of not committing a Type II error. There was a significant main effect for high and low sport commitment and each of the TPB constructs [Pillai's Trace = .232, $F(4, 271) = 20.473$, $p < .001$].

Univariate analysis of this effect revealed that intention [$F(1, 276) = 55.67$], attitude [$F(1, 276) = 28.07$], subjective norms [$F(1, 276) = 41.03$] and perceived behavioural control [$F(1, 276) = 12.96$] were significantly different at the $p < .001$ significance level. The effect size for this test was medium (.232) (Salkind, 2004) indicating that while the difference between variables is significant, the difference is weak (see Table 3.9 for a summary of the MANOVA results). Students who reported high sport commitment had significantly higher mean scores on all of the TPB categories when compared to those who reported lower levels of sport commitment.

Table 3.9

Multivariate Analysis of Variance for Sport Commitment and TPB Constructs

	<i>df</i>	<i>F</i>	<i>n</i> ²
<i>Intention</i>	1	55.67*	.232
<i>Attitude</i>	1	28.07*	.232
<i>Subjective Norm</i>	1	41.03*	.232
<i>Perceived Behavioural Control</i>	1	12.96*	.232

* $p < .001$

Objective 5: *Determine the relationship between sport commitment and intention to continue participating in: (i) intramural volleyball and, (ii) intramurals and other sports and physical activities in the future.*

Assumptions of Regression

Tabachnick and Fidell (2007) listed the assumptions that must be met before findings from the test can be generalized when using multiple regression. They state that there must be an absence of multicollinearity, that errors of prediction are independent of one another, and that normality, linearity, and homoscedasticity are assessed. The first assumption check is to determine that there is no perfect multicollinearity.

Multicollinearity exists when there is a strong correlation between the predictors and this poses a problem as “it becomes impossible to obtain unique estimates of the regression coefficient because there are an infinite number of combinations of coefficients that would work equally well” (Field, 2005, p. 174). The intent is to avoid a correlation coefficient of 1 (Field). With this data set there is no perfect linear relationship between intention to continue participating in intramural volleyball on a regular basis and the constructs of the Sport Commitment Model so multicollinearity is not a concern with this analysis. The second assumption to be checked is the assumption of independent errors. Using Durbin-Watson to check whether residuals in the model are independent follows the rule that the value should be between 1 and 3, and the closer to 2 the value is, the more reliable it is (Field). The Durbin Watson score for this analysis is 1.909 and meets the assumption of independent errors. Another assumption involves checking the heteroscedasticity of the data. Overall, the increments of the predictors lie along a straight line and the scatter plots for intentions were fairly randomly and evenly distributed

throughout the plot indicating a situation where the assumptions of linearity and homoscedasticity have been met. The final assumption is that the variables used are normally distributed. For this analysis there was a slightly skewed distribution. Overall, the assumptions for multiple regression have been met (see appendix C for assumption tables).

For the second regression analysis the first check is for no perfect multicollinearity. There is no perfect linear relationship between intention to participate in intramurals or other physical activity in the future and the constructs of the Sport commitment Model so multicollinearity is not a concern with this analysis. For the assumption of independent errors the Durbin Watson score for this analysis was exactly 2.00 and does meet the assumption. Again, the increments of the predictors lie along a straight line and the scatter plots for intentions were fairly randomly and evenly distributed throughout the plot indicating a situation where the assumptions of linearity and homoscedasticity have been met. The final assumption is that the variables used are normally distributed. For this analysis the distribution was skewed (see Appendix C).

Analysis

All questions in the Sport Commitment constructs were based on a five-point Likert scale. Each construct had three to five questions which were combined to create seven sport commitment variables (sport commitment, sport enjoyment, personal investments, social constraints, involvement opportunities, involvement alternatives and social support). These seven variables were used as predictors (independent variables) in the regression analysis with respondents' 'intentions to participate in intramural

volleyball on a regular basis' as the outcome or dependent variable (refer to table 3.10 and 3.11 for results of the regression analysis).

The overall R^2 was 0.209, indicating the model accounted for 21% of the variance in the importance of student's intent to participate in intramural volleyball on a regular basis. Only sport commitment ($t=4.27, p<.001$) and sport enjoyment ($t=4.63, p<.001$) were significant predictor variables in the regression equation. The strongest predictor of subjects' responses to the intent to participate in intramural volleyball on a regular basis was sport commitment ($\beta=0.28$) and sport enjoyment ($\beta=0.31$).

Table 3.10

Means, Standard Deviations, and Correlations for Intentions (Volleyball) and the Sport Commitment Constructs

Variables	<u>M</u>	<u>SD</u>	1	2	3	4	5	6	7
Intentions	4.39	0.95	.41	.42	.22	.03	.23	-.11	.19
1. Sport Commitment	15.52	3.44	--	.53	.51	.10	.48	-.20	.31
2. Sport Enjoyment	18.61	2.35		--	.42	.04	.52	-.27	.36
3. Personal Investments	13.63	3.21			--	.15	.52	-.09	.30
4. Social Constraints	9.58	3.91				--	.14	.18	.14
5. Involvement Opportunity	11.48	2.91					--	-.26	.48
6. Involvement Alternatives	11.16	4.06						--	-.07
7. Social Support	12.25	3.01							--

Table 3.11

Regression Analysis Summary using the Sport Commitment Constructs to Predict Intentions to Continue Participating in Intramural Volleyball

Variable	B	SEB	T	β
Sport Commitment	.08	.02	4.27	.28*
Sport Enjoyment	.12	.03	4.63	.31*
Personal Investments	-.01	.02	-0.62	-.01
Social Constraints	-.00	.01	-0.08	-.00
Involvement Opportunity	-.02	.02	-0.72	-.05
Involvement Alternatives	.00	.01	0.34	.02
Social Support	.01	.02	0.57	.03

Note: $R^2 = .228$ (N=302)

* $p < .05$

The second regression analysis was performed to determine the relationship between the six sport commitment constructs and sport commitment with the ‘intention to participate in intramurals or other sports and physical activities’ in the future. There was a significant relationship between intention to continue sport participation in the future with the sport commitment variable and the six constructs. The overall R^2 was 0.260, indicating that the model explained 26% of the variance in the intention to participate in intramurals or other sports and physical activities in the future. Only sport commitment ($t=3.00, p<.01$) and sport enjoyment ($t=2.58, p<.05$) constructs resulted in being significant predictor variables in the regression equation. The strongest predictor of subjects’ responses to the intent to participate in intramurals or other sports and physical activities in the future was sport commitment ($\beta=0.19$) and sport enjoyment ($\beta=0.17$) (see Table 3.12 and 3.13 for the results of the regression analysis).

Table 3.12

Means, Standard Deviations, and Correlations for Intentions (Other Sports and Physical Activity) and the Sport Commitment Constructs

Variables	<u>M</u>	<u>SD</u>	1	2	3	4	5	6	7
Intentions	4.59	0.76	.43	.42	.35	.10	.40	-0.21	.31
1. Sport Commitment	15.52	3.44	--	.53	.51	.10	.48	-0.20	.31
2. Sport Enjoyment	18.61	2.35		--	.42	.04	.52	-0.27	.36
3. Personal Investments	13.63	3.21			--	.15	.52	-0.09	.30
4. Social Constraints	9.58	3.91				--	.14	.18	.14
5. Involvement Opportunity	11.48	2.91					--	-0.26	.48
6. Involvement Alternatives	11.16	4.06						--	-0.07
7. Social Support	12.25	3.01							--

Table 3.13

Regression Analysis Summary using the Sport Commitment Constructs to Predict Intentions for Participating in Other Sports and Physical Activity

Variable	<u>B</u>	<u>SEB</u>	<u>T</u>	<u>β</u>
Sport Commitment	.04	.01	3.00	.19*
Sport Enjoyment	.05	.02	2.58	.17*
Personal Investments	.02	.02	1.36	.09
Social Constraints	.01	.01	0.96	.05
Involvement Opportunity	.02	.02	1.30	.09
Involvement Alternatives	-.02	.01	-1.89	-.10
Social Support	.03	.02	1.89	.11

Note: $R^2 = .277$ (N=302)

*p < .05

1

Objective 6: Determine if the level of sport commitment changes the relationship between the constructs from the Theory of Planned Behaviour.

Assumptions

For the regression analysis to be used several assumptions must be met. By doing an initial check of the correlation matrix it appears that the low levels of collinearity pose

little threat and based on the low coefficient results, multicollinearity is not a concern as the predictors do not correlate highly with each other (Field, 2005). The second assumption to be checked is the assumption of independent errors. Using Durbin-Watson to check whether residuals in the model are independent follows the rule that the value should be between 1 and 3, and the closer to 2 the value is, the more reliable it is (Field). The Durbin Watson score for this analysis is 1.811 and meets the assumption of independent errors. Another assumption involves checking that there is heteroscedasticity in the data. Overall, the scatter plots for high and low sport commitment are fairly randomly and evenly distributed throughout the plot. The final assumption is that the variables used are normally distributed. For low sport commitment, there was a fairly normal distribution and the distribution for high sport commitment was symmetrical but had a slightly negative kurtosis. Overall, the assumptions for multiple regression have been met (See Appendix C for Assumptions tables).

Analysis

Sport Commitment was separated into high and low where the median of 16 was used as the dividing point and anyone with an overall score of 15 or less was classified as low sport commitment and with a score of 17 to 20 were high sport commitment. Three variables in the Theory of Planned Behaviour (TPB) (attitudes, subjective norms and perceived behavioural control) were used as predictors in the regression analysis with intentions as the dependent variable. With the low Sport Commitment Group the overall R^2 was 0.205, indicating that the model explained 20.5% of the variance within intentions. Only subjective norms ($t=3.90$, $p<.001$) was a significant predictor variable in

the regression equation, and was also the strongest predictor of subjects' intentions ($\beta=0.32$) (refer to Tables 3.14 and 3.15).

Table 3.14

Means, Standard Deviations, and Correlations for Intentions and Theory of Planned Behaviour Constructs (Low Sport Commitment Group)

Variables	<u>M</u>	<u>SD</u>	1	2	3
Intentions	16.79	3.20	.24	.41	.32
1. Attitude	16.67	4.02	--	.21	.15
2. Subjective Norms	12.55	3.01		--	.39
3. Perceived Behavioural Control	29.31	4.58			--

Table 3.15

Regression Analysis Summary using the Theory of Planned Behaviour Constructs to Predict Intentions (Low Sport Commitment Group)

Variable	<u>B</u>	<u>SEB</u>	<u>T</u>	<u>β</u>
Attitudes	.12	.06	1.96	.15
Subjective Norms	.33	.08	3.90	.32*
Perceived Behavioural Control	.12	.06	2.17	.17

Note: $R^2 = .222$ (N=148)

* $p < .05$

The second regression analysis was run to determine the relationship between intention and the other TPB constructs for individuals with high sport commitment. The results indicate that the model did not account for or explain a significant amount of variance in intentions. There are no significant predictor variables in the regression equation. So, for those with high sport commitment, the constructs from the Theory of Planned Behaviour do not significantly explain their intentions to participate in the future (refer to Tables 3.16 and 3.17).

Table 3.16

Means, Standard Deviations, and Correlations for Intentions and Theory of Planned Behaviour Constructs (High Sport Commitment Group)

Variables	<u>M</u>	<u>SD</u>	1	2	3
Intentions	19.06	1.52	.08	.14	.01
1. Attitude	18.89	2.70	--	.27	.18
2. Subjective Norms	14.43	1.52		--	.17
3. Perceived Behavioural Control	31.37	4.90			--

Table 3.17

Regression Analysis Summary using the Theory of Planned Behaviour Constructs to Predict Intentions (High Sport Commitment Group)

Variable	<u>B</u>	<u>SEB</u>	<u>β</u>
Attitudes	.025	.053	.044
Subjective Norms	.126	.093	.126
Perceived Behavioural Control	-.007	.028	-.023

Note: $R^2 = .020$ (N=128)

There was no significant difference between the constructs

Summary of Findings

While there were a few changes made to the different types of analysis used, there were still some distinct and significant findings. After testing the Sport Commitment Model in the post-secondary intramural sport environment, the results of the confirmatory factor analysis (CFA) show that the Sport Commitment Model was not a good fit for the sample and there was enough support to state that the data does not fit the model.

Through a hierarchical regression analysis it was noted that the sixth construct, social support, did not explain any additional variance in students' sport commitment, nor was it a significant predictor of sport commitment in the post-secondary intramural environment. However, sport enjoyment, personal investment and involvement opportunities were the strongest, and only significant, predictors of sport commitment regardless of whether or not social support was included in the model.

When examining the constructs of the SCM and the different demographic variables it was found that there were no significant differences between males and females or between the competitive A and competitive B divisions and the constructs of the SCM and sport commitment. When considering the number of intramural sports participated in, sport commitment, sport enjoyment, personal investment and involvement opportunities all had a positive, significant relationship. It was determined that there were no significant differences between males and females in competitive A and there were no significant differences between males and females in the competitive B division. Through a MANOVA test it was determined that there was a significant difference between high and low sport commitment on each of the Theory of Planned Behaviour constructs; intention, attitude, subjective norm and perceived behavioural control.

The students indicated that the strongest predictors of the response “*I intend to participate in intramural volleyball on a regular basis*” and “*I intend to participate in intramurals or other sports and physical activity in the future*” were sport commitment and sport enjoyment. For the students with low sport commitment, subjective norms were the only significant predictor of subject’s intentions. For the students who reported high sport commitment, none of the constructs from the Theory of Planned Behaviour significantly explained their intentions to participate in intramurals and sports in the future.

Chapter 5 - Discussion

Introduction

The purpose of this study was to examine the sport commitment of post-secondary intramural sport participants and to develop a better understanding of students' intentions to continue participation in intramural volleyball and intramural and other sports and physical activities in the future. Specifically, this study addressed questions based around seven different commitment constructs developed with the Sport Commitment Model (SCM), as well as, constructs from the Theory of Planned Behaviour (TPB). The purpose of the study was also to test the SCM in the post-secondary intramural environment, as this model has never been used in this setting. Further, this study also examined the utility of *social support* as an additional construct to the SCM. Social support is a construct that has been added to the SCM in other studies with post-secondary students in the exercise realm (Wilson et al., 2004). The literature on the benefits of participating in intramurals addresses the importance of social support as a significant factor in motivating students to participate in intramural sports (Kanters & Forrester, 1997; Kimball & Freysinger, 2003; Forrester, Arterberry, & Barcelona, 2006; Beggs, Stitt & Elkins, 2004) and has also been found to be a key social benefit stemming from intramural sport participation (Artinger et al., 2006).

Discussion

This study examined post-secondary students who participated in intramural sports and the factors that keep them committed to their sport pursuits and their intention to continue with sport in the future. The commitment questions on the survey were taken from the Sport Commitment Model (SCM) (Scanlan et al., 1993a) and the intention

questions were derived from the Theory of Planned Behaviour (TPB) (Ajzen, 1988, 1991). The sport commitment questions focused on sport enjoyment, personal investment, social constraints, involvement opportunities, involvement alternatives, and social support. The questions addressing the TPB focused on intention, attitude, subjective norms, and perceived behavioural control.

Research Objective 1 - Confirmatory Factor Analysis

This was the first study to address the SCM in the post-secondary intramural environment and the confirmatory factor analysis (CFA) demonstrated that while each item significantly loaded on its corresponding factor, overall the data did not fit the SCM. The model has been successful with the post-secondary demographic in the fitness realm (Wilson et al., 2004). The results of the study by Wilson et al. “support certain structural relationships among commitment constructs outlined by the SCM in the exercise domain” (p. 414). Likewise, Weiss, Kimmel and Smith (2001) tested the model with junior tennis players and after removing a few unreliable items the results revealed a satisfactory fit of the model to the data as a majority of fit indices met statistical criteria. The results of this study contradict these findings from previous research in that the data in this study did not fit the model, according to four indices commonly accepted when conducting a confirmatory factor analysis.

The findings from other studies that examined the SCM using confirmatory factor analysis were different from the findings in this study. One plausible reason for this difference is that the environment the SCM is used in has an impact on the results. In the study done by Wilson et al. (2004), the post-secondary demographic was used but the SCM was analyzed with the Exercise Commitment Scale (ECS) and included a ‘have to’

and ‘want to’ component that is frequently highlighted in commitment literature (Wilson et al., 2004). Zahariadis et al. (2006) found that the analysis was acceptable for the model testing; however, the factor analysis looked at the Sport Commitment Model and the Sport Motivation Scale. With the current study, the Sport Commitment Model was examined on its own, without additional variables being added from other theories or models. Another possible reason for the difference in results is an outcome of manipulating the model. Weiss, Kimmel and Smith (2001) reported that while testing the fit of the model to the data they were able to find a satisfactory fit only after removing two unreliable items (involvement opportunities and sport commitment). The same procedure was followed by Alexandris et al. (2002) where they used different models to test the data and determine if the fit indexes were adequate. With changes to the original model, the modifications showed improved fit indexes. In the current study, the SCM constructs were all included to test the fit of the model to the data. These are a few possible reasons for why there are different findings for the confirmatory factor analysis of the SCM with this study and other previous studies that looked at the SCM.

Research Objective 2 – Social Support

Similar to other studies, this research was looking to support possible model expansion and modification with the addition of a sixth construct; social support. In this study, there was a significant positive relationship between social support and student’s commitment to their intramural participation ($R=.311$, $df=300$, $p\leq.001$). There have been multiple studies which have also included the social support construct with varying results. There have been conflicting views on the utility of the additional construct of social support in the SCM. The confirmatory factor analysis determined that the data did

not fit the model. While the literature supports the social benefits of participating in intramurals for post-secondary students, this study did not find that the construct of social support explained any additional variance in respondents' sport commitment. However, there have been positive results in previous studies that have used social support as an additional construct and it warrants further study.

Weiss, Kimmel and Smith (2001) tested the model with youth tennis players and found that social support was not a significant predictor of commitment. In their study, the original model and a variation of the original (with enjoyment as a mediating variable between the determinants and commitment) were tested and in both cases social support was not a significant predictor of commitment or enjoyment in the models. However, Wilson et al. (2004) found that exploratory and confirmatory factor analyses supported the presence of social support as a determinant of sport commitment. Carpenter (1992) included support from specific groups and the only significant type of social support that emerged was parental support (as cited in Weiss & Weiss, 2007). Scanlan, Russell, Beals and Scanlan (2003) found a positive relationship between social support from parents, coaches, and teammates and sport commitment among elite athletes. As only a few studies have investigated the relationship between social support and sport commitment, more research is needed as varying results have been reported between groups.

Within the post-secondary environment, the literature has revealed that students who are active in intramurals perceive social benefits from their participation. In a study done by Artinger et al. (2006) on undergraduate students who were participating in a variety of intramural sports, the respondents indicated that the greatest benefit they received from their involvement was in the area of personal social benefits, social group

bonding, and intramural sports contributing to students' social integration into the university community. Artinger (2006) found that students identified intramurals as an important part of college social life. Furthermore, prior research on sport participation with post-secondary students has found that social benefits are a strong motivator for intramural participation (Kanters & Forrester, 1997; Kimball & Freysinger, 2003; Forrester, Arterberry, & Barcelona, 2006; Beggs, Stitt & Elkins, 2004).

Research Objective 3 – Sport Commitment and Gender, Competition, and Time Involved

Previous studies using the SCM have examined males and females within the same study but have not separated them in the analysis. The sample is generally examined as a whole. This result appeared in the early testing of the SCM. Scanlan et al. (1993b) separated males and females by age and results indicated there was no gender by age interaction and there were no main effects so the sample was examined as a whole for the remainder of the analyses. The same results were found with this current study; there was no significant difference between males and females and the six constructs of the SCM and sport commitment. There was also no significant difference between males and females in competitive A or between males and females in competitive B with the constructs of the SCM. For all the remaining analyses in this study, the data set was examined as a whole.

1

With the demographic of the participants it was not possible to compare males and females in the different levels of sport commitment as a result of the large difference in group sizes. However, other research was able to identify differences between those who are at a higher level of competition and those who are less competitive. Weiss and Weiss (2007), for example, found that those at the lower competitive level reported higher sport

It is difficult to draw on comparisons to other studies as research in the area of sport commitment addresses athletes participating in one sport and does not address the other sport pursuits of the participants. If multiple sport participation is considered as a time frame of commitment, it can be said that as the number of sports increases so does the commitment of time to those sports. Carpenter and Scanlan's (1998) study of sport participation over time saw an increase in involvement opportunities and enjoyment as commitment increased. Higher commitment was reported among players who "perceived an increase in the opportunities associated with continued involvement" (Carpenter & Scanlan, p. 362). Based on the results of the study done by Carpenter and Scanlan, it appears that over time, if commitment increases, so does the players' perception of the unique benefits of continuing their involvement. It would benefit the sport commitment field of research to further examine the long term impact (positive, negative, or stagnant) of sport participation. By only conducting research on a participant's sport commitment and intent to continue their sport pursuits during one isolated time or with one survey, there are many time frame factors that are not accounted for. Also, as time progresses, the commitment levels change and this is not reflected during a single data collection session. It would be a benefit to collect data at the beginning of a season, mid-season and at the end of the season to see which area(s) of sport commitment have changed. It would also be beneficial to follow different participants through different sports over the course of an entire school year.

Research Objective 4 – High and Low Sport Commitment

This study also compared the differences between high and low sport commitment and the variables (attitude, subjective norm, perceived behavioural control, and intentions) in the Theory of Planned Behaviour (TPB). The results indicated a significant main effect for high and low sport commitment and each of the TPB constructs. This is similar to the study by Armitage (2005) who reported that all the scores of the TPB variables were extremely positive, with participants reporting positive attitudes and intentions with respect to engaging in regular physical activity.

However, in Armitage's (2005) study the subsequent attendance was low despite the reported positive attitudes and intentions in a sample of highly motivated people. In the current study, this could be a similar situation. Individuals who had higher mean scores on each of the constructs from the TPB were the participants with higher sport commitment scores. However, this study did not address the long term results of sport commitment and the TPB constructs. The combination of TPB constructs did explain some of the variance in intentions with those in the low sport commitment group. Only subjective norms ($t=3.90, p<.001$) was a significant predictor variable in the regression equation. If the means are compared between the high and low sport commitment groups, there are clear trends with regards to the means of each of the TPB constructs. With intentions, attitudes, subjective norms and perceived behavioural control the group with high sport commitment had higher average scores for each construct when compared to the average scores of those in the low sport commitment group.

The TPB construct 'Subjective Norms' is defined as perceived social pressure to engage or not engage in an activity. When comparing the low and high SC groups it was

noted that the high sport commitment group had higher average scores than the low sport commitment group on the relevant sport commitment constructs. The high sport commitment group had a higher average score ($m=13.08$) for support from peers to continue participating than those with low sport commitment who perceived to have less social support ($m=11.49$).

Research Objective 5 – Linking the Theories

There are currently no studies that use both the Theory of Planned Behaviour (TPB) and The Sport Commitment Model (SCM) with research involving sport, or more broadly physical activity. However, the two theories are linked in this study - with the SCM investigating current participation while the TPB is a widely used framework for understanding and predicting health behaviours (Connor & Sparks, 1996). Using this idea, intramural programmers should note that the students who are actively involved in sports and have intentions to continue are the individuals to target. There is less resistance to changing current behaviour so they will continue to participate in intramural sports.

Research Objective 6 – High and Low Sport Commitment and the TPB

Subjective Norms was the strongest predictor of subject's intention to participate in intramurals and sports in the future. For those with low sport commitment, it is evident that their intention to continue participating in intramurals is influenced by their peers. According to the TPB, subjective norms can predict normative beliefs which reflect whether a person thinks certain influential groups consider it important to participate or not participate in a behaviour (in this case, to participate in intramurals) and the motivation that person has to comply with that groups view (McMillan & Conner, 2003). While this is a general statement about the TPB, it does reflect that students' intentions to

participate in intramurals can be strongly influenced by their peers and this can change their behaviour. Those who reported having low sport commitment, are more likely to stay involved if their peer group considers participation as important.

Limitations

The Sport Commitment Model (SCM) has only been used with the post-secondary demographic in the fitness and exercise realm (Wilson et al., 2004). While the SCM has been used with this demographic, this was the first time it was applied in an intramural setting. Originally, the SCM was developed and used in a survey form. All of the questions in each of the constructs were based on a 5-point Likert scale. As a result of this being the original research format for the SCM, studies that involved SCM are quantitative in nature and are questionnaire based. However, there have been instances where the SCM was used in qualitative research. For example, Scanlan, Russell, Beals and Scanlan (2003) interviewed players from the New Zealand All Blacks, a world-class rugby team. The structured interviews were a new approach that created a collaborative environment that led to a partnership between the interviewer and the participant to create a personal commitment picture. This study also demonstrates the flexibility of the SCM which was originally designed and tested in the youth and adolescent sport context, but also proved to be applicable in the adult, elite athlete realm.

While the SCM is versatile in the approach, environment, demographic and level of competition, with regards to this study there were limitations. This was the first time the SCM was used to examine post-secondary student's commitment to intramural sports, creating particular limitations and recommendations. At Brock, intramural volleyball was held three nights a week and in some cases the same participants attended on multiple

nights. While numbers indicated there were over 700 intramural volleyball participants, some people might have been counted more than once. It was the understanding that students could not attend on more than one evening; however, the regulation of participants was determined by the supervision of the referees and if no one was confirming participation and checking identification, it was easier for students to participate on multiple teams. Another problem with the data collection was that the same people attend each week and the same people repeatedly declined to participate in this study. While surveys were collected over three weeks, the same individuals chose not to participate; therefore there could potentially be a non-response bias. The only time volleyball participants were interested in completing a survey was before their game or if they had a break between games. If people were leaving they were not interested in completing the survey. It was easiest to get volunteers when teams had a break between games. If teams played back to back games there was no time for the players to complete the surveys.

Recommendations for Future Research

Future research should specifically address the SCM, the post-secondary demographic and intramural sports as this is a new area of research that needs further exploring. One suggestion for future research is to survey participants in multiple sports during their season. This study only looked at volleyball players however, there were other intramural sports that were running consecutively at Brock University.

The data collection procedures for this study were challenging. It was difficult getting the students to take a break during their game time or getting them to fill out a survey prior to or right after a game. As a solution to this problem surveys could be handed out

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The data collection procedures for this study were challenging. It was difficult getting the students to take a break during their game time or getting them to fill out a survey prior to or right after a game. As a solution to this problem surveys could be handed out

in classes to all students or randomly in the hallway. This would allow students to complete the survey at their discretion and not feel rushed, and it would be a way of getting data on participants who are active in intramurals outside of just volleyball.

Another way to get a better picture is to distribute the survey to post-secondary students from multiple universities. The greater sample size could create different, more compelling findings. Another variation on the current study would be to include questions, and get information, about prior participation in intramurals or extramural sport participation outside of Brock and before entrance to university (for students coming from high school or those who are mature students and were not in a school setting prior to admission). This would allow for greater control of prior participation, current participation levels, and the intent for future sport involvement.

There needs to be changes made in future research where the Sport Commitment Model and the determinants continue to be tested. The confirmatory factor analysis demonstrated that while each item significantly loaded on its corresponding factor, overall the data did not fit the model. The SCM needs to be further tested in the post-secondary intramural environment to determine if the model is tenable with this demographic and in this sporting context. While there seems to be more studies including Social Support as an additional construct to the SCM, the results continue to be mixed. Future research should continue examining social support as a result of the inconsistent findings regarding the predictive use of social support on commitment. The research lacks consistent findings on the relevance of adding Social Support as a construct to the SCM. Also, there needs to be consistency with how the Social Support construct is used as currently the questions lack consistency across studies.

The majority of the work done on the SCM has been a one-time, survey based study. Future research involving the SCM should include more longitudinal studies. Sport Commitment researchers should explore commitment over time, especially in relation to intentions to see if the level of commitment stays the same, decreases, or increases. Longitudinal research would allow for interesting comparisons in the sport commitment scores as well as the scores of the variables in the Theory of Planned Behaviour (TPB).

The overall purpose of this study was to determine what keeps students committed to sports as the post-secondary years are a time when physical activity begins to drop off. This is an age when healthy habits should be established and carried over into adulthood. Vanreusel (1997) noted that participation patterns are moderate to high during childhood and youth and decrease to low to moderate in young adulthood and on. Physical inactivity increases with age and it is a critical health issue in Canada as the prevalence of obesity has more than doubled in the past two decades (Le Petit & Barthelot, 2005). There are many noted benefits to remaining active and engaged in physical activity and sport. Specifically with the post-secondary population, the benefits of intramural participation (academic, college satisfaction, self-esteem, stress, and physical activity) are many. It is important to understand what keeps students committed to sport pursuits. While there are many benefits of intramural sport participation which can positively contribute to sport participation rates of post-secondary students, the true value of intramurals lies in their ability to encourage continued sport participation after school ends (Forrester, Ross, Geary, & Hall, 2007) as the research has found that the decline in physical activity only decreases after graduation (Kilpatrick, Herbert, & Bartholomew, 2005). Campus

recreational sports professionals need to use the findings and develop better programs aimed to improve physical activity patterns of college and university students.

The most interesting findings in this study indicate that sport commitment, sport enjoyment, personal investments, and involvement opportunities have a positive significant relationship with frequency of intramural sport participation. Sport commitment and sport enjoyment were the only SCM constructs that were significant predictors of intent to continue participating in intramural volleyball on a regular basis and intent to participate in intramurals or other sports and physical activity in the future. With regards to the TPB, students who reported high sport commitment had the higher mean scores on all the TPB constructs when compared to those with reported low sport commitment. Also, those with low sport commitment reported subjective norms as the strongest predictor of intentions.

These findings should be taken into consideration by intramural co-ordinators and sport practitioners. From the post-secondary student responses, there are indications of intent to continue participation. The participation of the students is predominantly influenced by subjective norms, high sport commitment, and high sport enjoyment. High scores with subjective norms indicate that students *expect*, *intend*, and *want* to participate in intramurals in the future. With high sport commitment scores students are very dedicated to playing on an intramural team and would be willing to do a lot to keep playing intramurals. Students report that with sport enjoyment, they want to participate if they perceive their pursuits as enjoyable and fun and it makes them happy. These are key areas that should be targeted and pursued by sport practitioners.

Campus recreational professionals need to focus on the outcomes and benefits of the intramural services and programs. The emphasis should be placed on the quality of the opportunities. Students have identified that their sport participation is driven by the enjoyment they get from participating. Intramural directors should place the importance of intramural involvement on the immediate benefits and improvements to one's lifestyle as well as the long term benefits of being more likely to sustain an active lifestyle after graduation and into later adulthood. Sports programs should be critically examined with regards to their contribution to long term continued participation. These findings should be used as a springboard to get students involved and keep them involved in sport and physical activity while completing their post-secondary education and encourage students to carry those habits into later years.

The results of this study lend support to previous work done using either the SCM or the TPB; however, there were also some inconsistencies with the findings of this study and prior research. This is the first time the SCM and the TPB were combined to examine the relationship between sport commitment and intentions to participate in intramural sports of post secondary students. These results warrant further research and provide support to the continued use of both the SCM and the TPB with this demographic.

Future research should continue to explore the relationship between students' desire or resolve to continue sport participation (sport commitment) and their readiness to perform a given behaviour (intentions). It would be beneficial to determine if trends emerge with this demographic and both the SCM and TPB constructs in the future with the overall aim of keeping post-secondary students engaged in physical activity both during their time at college and university as well as after graduation.

Appendix A – Ethics Approval

DATE: February 12, 2008

FROM: Michelle McGinn, Chair
Research Ethics Board (REB)

TO: Dr. Scott Forrester, Recreation and Leisure Studies
Sarah Jess

FILE: 07-224 FORRESTER/JESS

TITLE: Testing the Sport Commitment Model in a Sample of Post-Secondary Intramural Sport Participants

The Brock University Research Ethics Board has reviewed the above research proposal.

DECISION: Accepted as is

This project has received ethics clearance for the period of February 12, 2008 to August 29, 2008 subject to full REB ratification at the Research Ethics Board's next scheduled meeting. The clearance period may be extended upon request. *The study may now proceed.*

Please note that the Research Ethics Board (REB) requires that you adhere to the protocol as last reviewed and cleared by the REB. During the course of research no deviations from, or changes to, the protocol, recruitment, or consent form may be initiated without prior written clearance from the REB. The Board must provide clearance for any modifications before they can be implemented. If you wish to modify your research project, please refer to <http://www.brocku.ca/researchservices/forms> to complete the appropriate form Revision or Modification to an Ongoing Application.

Adverse or unexpected events must be reported to the REB as soon as possible with an indication of how these events affect, in the view of the Principal Investigator, the safety of the participants and the continuation of the protocol.

If research participants are in the care of a health facility, at a school, or other institution or community organization, it is the responsibility of the Principal Investigator to ensure that the ethical guidelines and clearance of those facilities or institutions are obtained and filed with the REB prior to the initiation of any research protocols.

The Tri-Council Policy Statement requires that ongoing research be monitored. A Final Report is required for all projects upon completion of the project. Researchers with projects lasting more than one year are required to submit a Continuing Review Report annually. The Office of Research Services will contact you when this form *Continuing Review/Final Report* is required.

Please quote your REB file number on all future correspondence.

Kate Williams
Research Ethics Assistant
Office of Research Ethics, MC D250A
Brock University - Office of Research Services
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St. Catharines, Ontario, Canada L2S 3A1
phone: (905)688-5550, ext. 3035 fax: (905)688-0748
email: reb@brocku.ca
<http://www.brocku.ca/researchservices/ethics/humanethics/>

Appendix B – Survey and Consent Letter

**Testing the Sport Commitment Model in a Sample of Post-Secondary Intramural
Sport Participants at Brock University**

INSTRUCTIONS:

Please invest a few moments of your time to provide information about your current intramural sports participation here at Brock University. This survey will only take 15 minutes of your time. Please return the completed survey to the researcher. Thank You!

SECTION I: Demographics

1. Gender (please check one):	<input type="checkbox"/> Male	<input type="checkbox"/> Female
2. Age:	_____ (years)	
3. Year of Study	<input type="checkbox"/> 1 st year	<input type="checkbox"/> 2 nd year <input type="checkbox"/> 3 rd year <input type="checkbox"/> 4 th year <input type="checkbox"/> 5 th year or higher <input type="checkbox"/> Graduate Studies
4. Intramural Volleyball Division:	<input type="checkbox"/> Competitive A	<input type="checkbox"/> Competitive B
5. What other Intramural Sports do you participate in? (please check all that apply)		
<input type="checkbox"/> Slow Pitch	<input type="checkbox"/> Flag Football	<input type="checkbox"/> Ball Hockey <input type="checkbox"/> Ultimate Frisbee
<input type="checkbox"/> Water Polo	<input type="checkbox"/> Soccer	<input type="checkbox"/> Basketball <input type="checkbox"/> Badminton
<input type="checkbox"/> Dodgeball	<input type="checkbox"/> Broomball	<input type="checkbox"/> Underwater Hockey <input type="checkbox"/>
Other _____		

SECTION II: SPORT COMMITMENT

	Not at all Dedicated	A little Dedic- ated	Sort of Dedic- ated	Dedic- ated	Very Dedicated
1. How dedicated are you to playing on an intramural team?	1	2	3	4	5
2. How difficult would it be for you to quit your	1	2	3	4	5
3. How determined are you to keep playing in intramurals?	1	2	3	4	5
	Nothing at all	A few Things	Some Things	Many Things	A lot of Things
4. What would you be willing to do to keep playing intramurals?	1	2	3	4	5

SECTION III – SPORT ENJOYMENT

	Not at All	A little	Sort of	Pretty Much	Very Much
1. Do you <i>enjoy</i> playing intramurals this semester?	1	2	3	4	5
2. Are you <i>happy</i> playing intramurals this semester?	1	2	3	4	5
3. Do you have <i>fun</i> playing intramurals this	1	2	3	4	5
4. Do you <i>like</i> playing intramurals this semester?	1	2	3	4	5

SECTION IV – PERSONAL INVESTMENTS

	None	A little	Some	Pretty Much	Very Much
1. How much of your <i>time</i> have you put into intramurals this semester?	1	2	3	4	5
2. How much <i>effort</i> have you put into playing intramurals this semester?	1	2	3	4	5
3. How much of <i>your own money</i> have you put into playing in Intramurals this semester of things like fees and equipment?	1	2	3	4	5
4. How much <i>energy</i> have you put into intramurals this semester?	1	2	3	4	5

SECTION V – SOCIAL CONSTRAINTS

	Not at all how I Feel	A little how I Feel	Sort of how I Feel	Pretty much how I Feel	Very much how I Feel
1. I feel I have to play in intramurals so I can be with my friends.	1	2	3	4	5
2. I feel I have to play in intramurals to please others.	1	2	3	4	5
3. People will be disappointed in me if I quit intramurals.	1	2	3	4	5
4. People will think I'm a quitter if I stop participating in intramurals.	1	2	3	4	5

SECTION VI – INVOLVEMENT OPPORTUNITIES

	Not at all	A Little	Sort of	Pretty Much	Very Much
1. Would you miss your friends in intramurals if you left?	1	2	3	4	5
2. Would you miss being an intramural participant if you left intramurals?	1	2	3	4	5
3. Would you miss the good times you have had playing intramurals this semester if you left intramurals?	1	2	3	4	5

SECTION VII – INVOLVEMENT ALTERNATIVES

	Not at all How I Feel	A little how I Feel	Sort of how I Feel	Pretty much how I Feel	Very much how I Feel
1. Compared to participating in intramurals, there are other things I could do which would be more fun.	1	2	3	4	5
2. Compared to participating in intramurals, there are other things I could do which would be more enjoyable.	1	2	3	4	5
3. Compared to participating in intramurals, there are other things I could do which would be more worthwhile.	1	2	3	4	5
4. I would be happier doing something else instead of participating in intramurals.	1	2	3	4	5
5. I would like to be doing something else instead of participating in intramurals.	1	2	3	4	5

SECTION VIII – SOCIAL SUPPORT

	Not at all How I Feel	A little how I Feel	Sort of how I Feel	Pretty much how I Feel	Very much how I Feel
1. People important to me support my intramural participation.	1	2	3	4	5
2. People important to me think it is okay to participate in intramurals.	1	2	3	4	5
3. People important to me encourage me to participate in intramurals.	1	2	3	4	5

SECTION IX – CURRENT AND FUTURE PARTICIPATION

- 1.) I intend to participate in intramural **volleyball** on a regular basis.
- Strongly Disagree 1 2 3 4 5 Strongly Agree
- 2.) I will make an effort to attend intramural **volleyball** games regularly.
- I definitely will not 1 2 3 4 5 I definitely will

3.) Over the next month, I intend to participate in intramurals at least _____ times per week (including volleyball and all other intramural sports offered at Brock).

4.) The other intramural sports I intend to participate in this semester are: (check all that apply)

☐ Dodgeball ☐ Broomball ☐ Indoor Soccer ☐ Badminton ☐ Underwater Hockey

5.) I will make an effort to continue participating in intramurals or other sports and physical activities in the future.

Strongly Disagree 1 2 3 4 5 Strongly Agree

6.) I intend to participate in intramurals or other sports and physical activities in the future.

I definitely will not 1 2 3 4 5 I definitely will

7.) For me, participating in intramurals regularly over the next month would be: **(Please circle the number that corresponds to your level of agreement)**

Harmful	1	2	3	4	5	Beneficial
Foolish	1	2	3	4	5	Wise
Not enjoyable	1	2	3	4	5	Enjoyable
Unpleasant	1	2	3	4	5	Pleasant

8.) Please indicate your level of agreement to the following statements about your intentions to participate in intramurals in the future.

IN THE NEXT MONTH:	<i>Not at all</i>		Undecided		Every Week
a. I expect to participate in intramurals	1	2	3	4	5
b. I intend to participate in intramurals	1	2	3	4	5
c. I want to participate in intramurals	1	2	3	4	5

9.) Please indicate your level of agreement to the following statements:

	<i>Strongly Disagree</i>	<i>Disagree</i>	<i>Undecided</i>	<i>Agree</i>	<i>Strongly Agree</i>
a. Most people who are important to me think that I should participate in intramurals	1	2	3	4	5
b. It is expected of me that I should participate in intramurals	1	2	3	4	5
c. I feel under social pressure to participate in intramurals	1	2	3	4	5
d. People who are important to me want me to participate in intramurals	1	2	3	4	5
e. I am confident that I could participate in intramurals if I wanted to	1	2	3	4	5
f. For me, to participate in intramurals is easy	1	2	3	4	5
g. The decision to participate is easy	1	2	3	4	5
h. Whether I participate in intramurals or not is entirely up to me	1	2	3	4	5

Thank you for your time and participation in this study!

Please return this completed survey to the researcher:

Sarah Jess
Department of Recreation and Leisure Studies

Informed Consent Letter

Date: February 2008
 Project Title: Testing the Sport Commitment Model in a Sample of Post-Secondary Intramural Sport Participants

Principal Student Investigator:
Sarah Jess, MA Student
 Department of Recreation and Leisure Studies
 Brock University
 sj01aa@brocku.ca

Faculty Supervisor:
Dr. Scott Forrester
 Department of Recreation and Leisure
 Studies
 Brock University
 (905) 688-5550 Ext. 4247
 scott.forrester@brocku.ca

INVITATION

You are invited to participate in a research study that will investigate the sport commitment of intramural sport participants. The purpose of this study is to contribute to the limited body of knowledge on post-secondary participation in intramural sports; specifically in relation to sport commitment. The Sport Commitment Model [Scanlan, Carpenter, Schmidt, Simons & Keeler (1993)] has not been used in the area of intramurals at the post-secondary level which allows for both competitive and recreational participants. To understand the full nature of sport commitment, more age groups and different sport environments should be considered in relation to the determinants and the level of sport commitment.

WHAT'S INVOLVED

As a participant, you will be asked to fill out the questionnaire on sport commitment and recreational intramural sports participation. The questionnaire will take approximately 10 minutes of your time to complete. Once all the data is collected it will be analyzed using SPSS (Statistical Package for the Social Sciences).

POTENTIAL BENEFITS AND RISKS

The possible benefits of participation include helping to identify the constructs that most influence students' desire or resolve to continue participation in sport which will assist campus recreational sports departments in post-secondary institutions in identifying the best programs for students to keep them active and encourage positive choices in physical activity pursuits. There are no known or anticipated risks associated with participation in this study.

CONFIDENTIALITY

All information you provide is considered confidential; your name will not be included or, in any other way, associated with the data collected in the study. Furthermore, because our interest is in the average responses of the entire group of participants, you will not be identified individually in any way in written reports of this research.

Data collected during this study will be stored in a locked filing cabinet in Dr. Forrester's office in the Department of Recreation and Leisure Studies. Data will be kept until December of 2008 at which time the surveys will be shredded and recycled. Access to this data will be restricted to those directly involved in the study including Sarah Jess and Dr. Forrester.

VOLUNTARY PARTICIPATION

Participation in this study is voluntary. If you wish, you may decline to answer any questions or participate in any component of the study. Further, you may decide to withdraw from this study at any time and may do so without any penalty or loss of benefits to which you are entitled. Since the surveys are anonymous and contain no personal information linking an individual to a specific survey, participants may not withdraw from the study once they have submitted their survey.

PUBLICATION OF RESULTS

Results of this study may be published in professional journals and presented at conferences. Feedback about this study will be available from Sarah Jess at sj01aa@brocku.ca. Results of this study will be available in September 2009.

CONTACT INFORMATION AND ETHICS CLEARANCE

If you have any questions about this study or require further information, please contact the Principal Student Investigator or the Faculty Supervisor using the contact information provided above. This study has been reviewed and received ethics clearance through the Research Ethics Board at Brock University (insert file #). If you have any comments or concerns about your rights as a research participant, please contact the Research Ethics Office at (905) 688-5550 Ext. 3035, reb@brocku.ca.

Thank you for your assistance in this study. Please keep a copy of this form for your records.

Appendix C – Assumptions Tables

Research Objective 2

Table 1: Assumption of Heteroscedasticity with the Sport Commitment constructs Sport Commitment

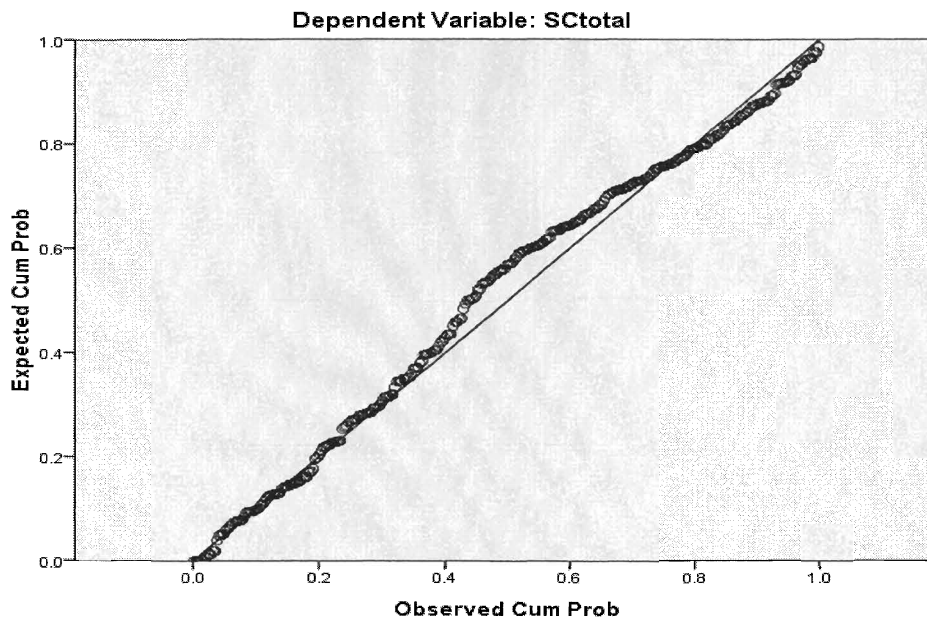
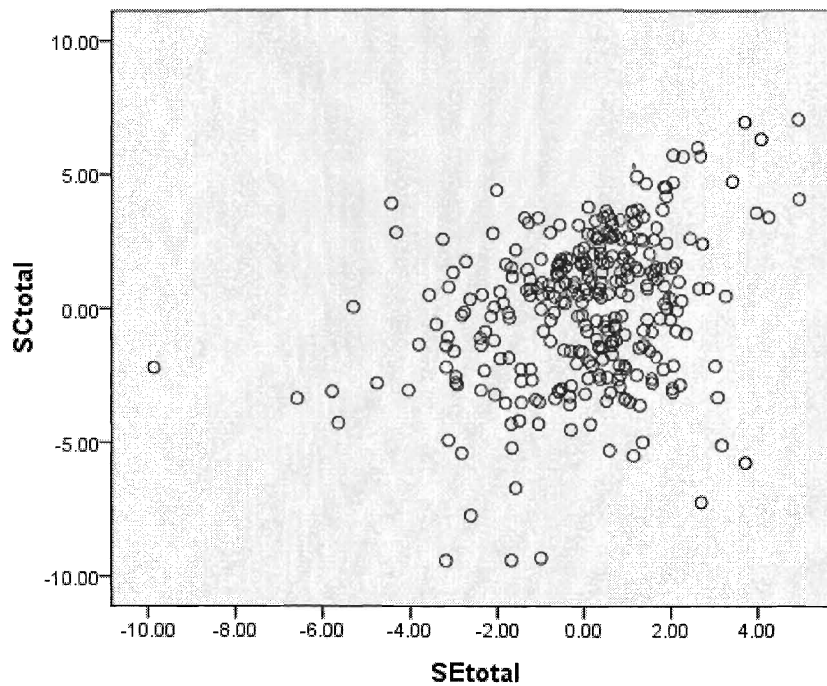
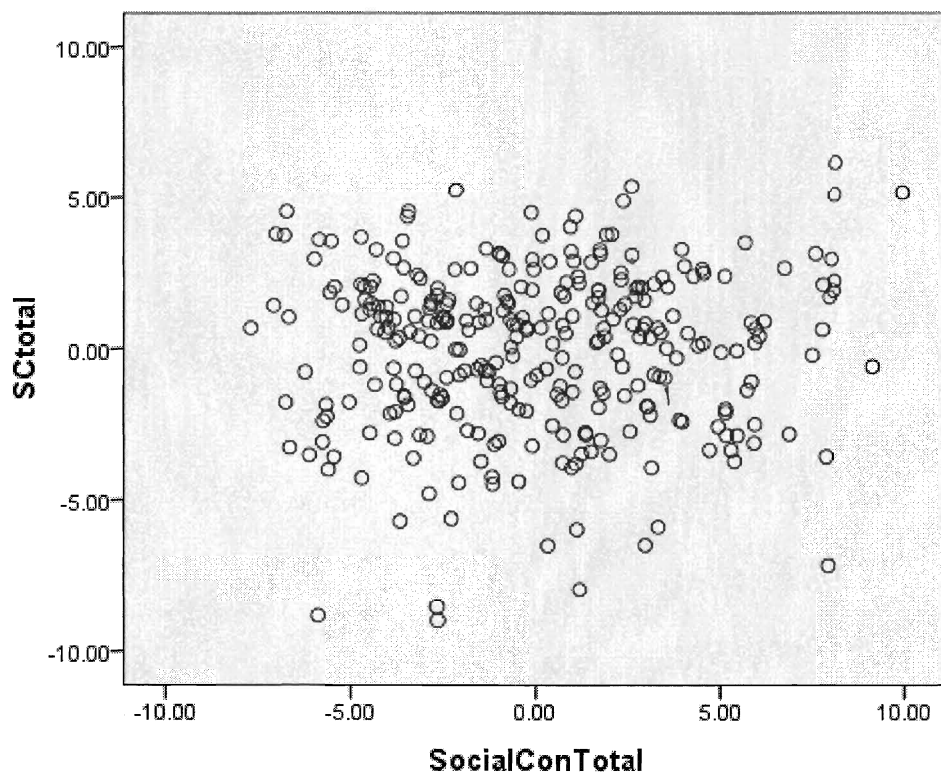
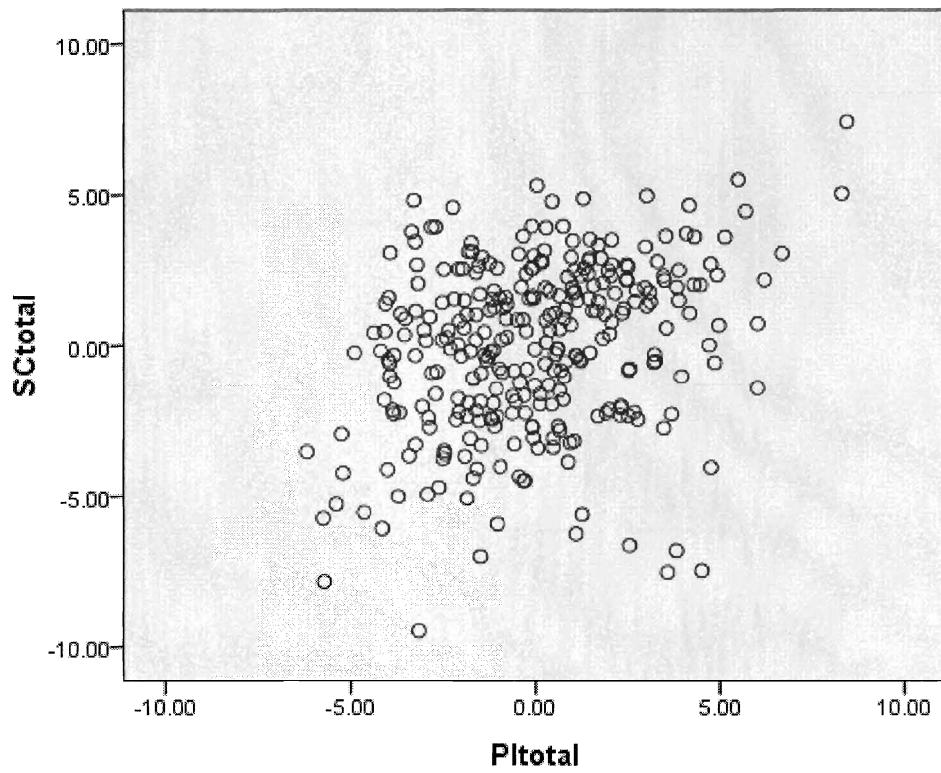
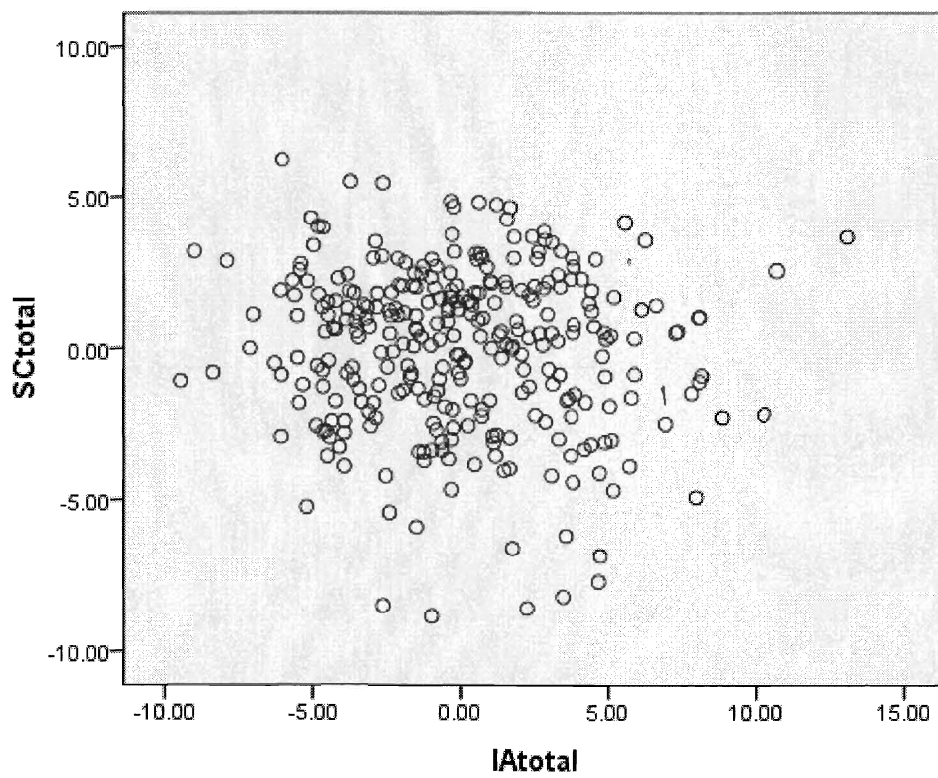
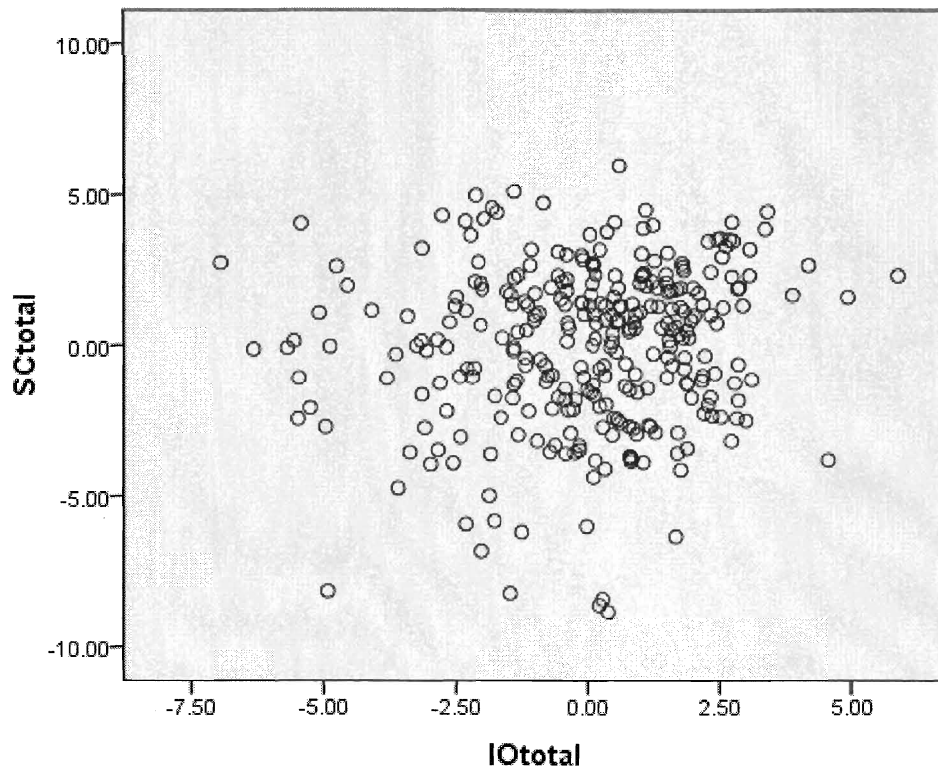


Table 2: The Assumption of Linearity (Scatter Plots) with the Sport Commitment constructs and Sport Commitment







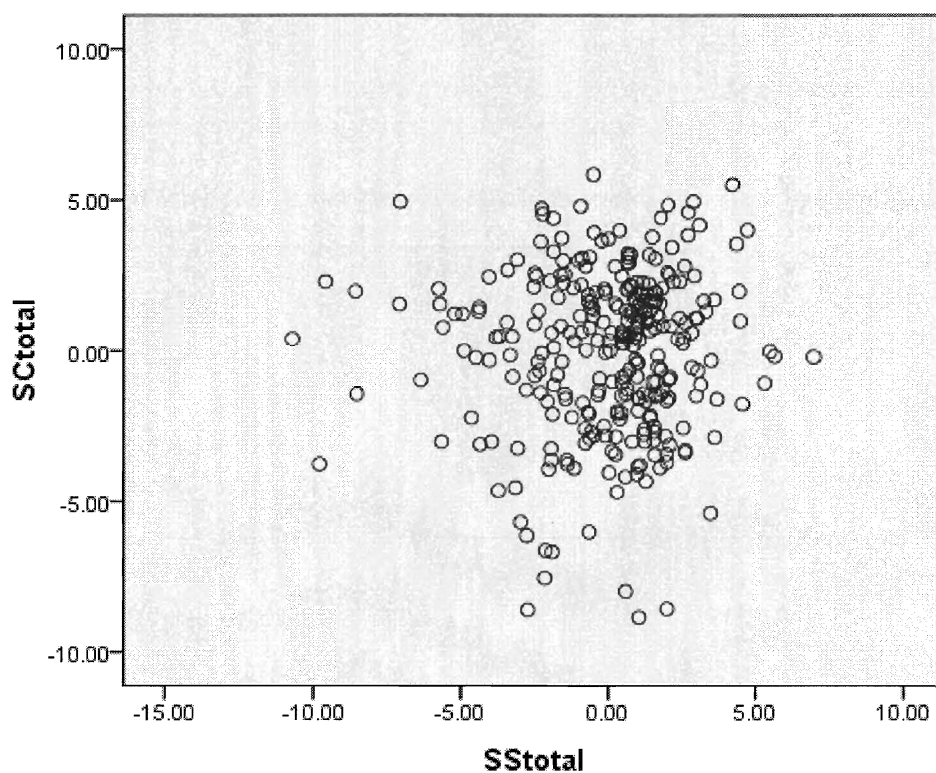
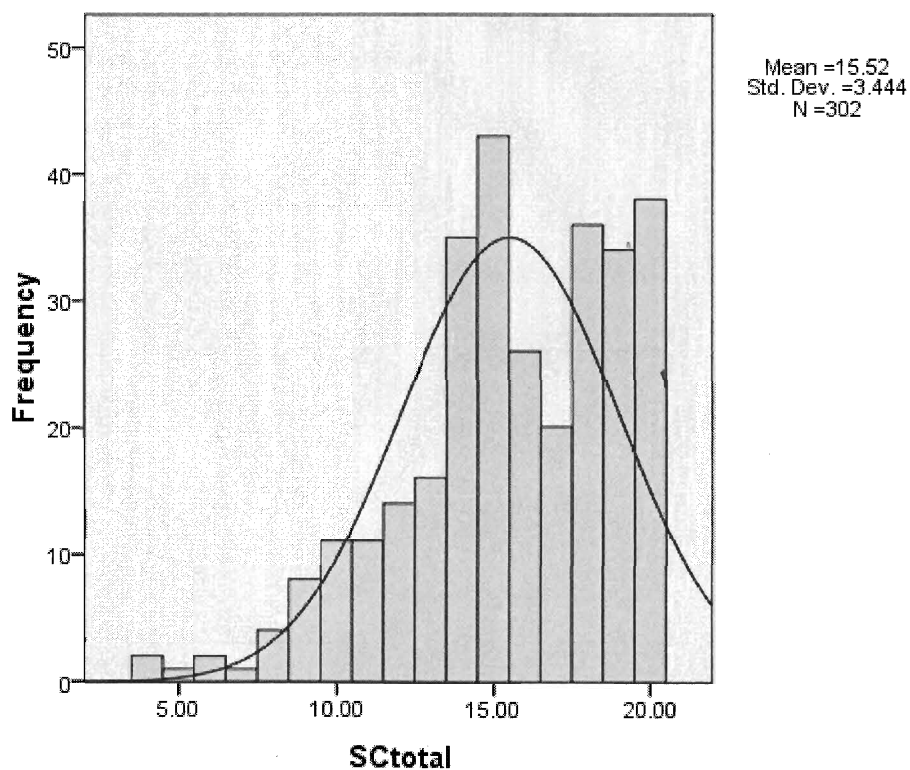


Table 3: The Assumption of Normality with the Sport Commitment constructs and Sport Commitment



Research Objective 5 (i.)

Table 4: Assumption of Heteroscedasticity with the Sport Commitment constructs and the intent to continue participating in volleyball intramurals

Dependent Variable: Intent to participate in volleyball on a regular basis

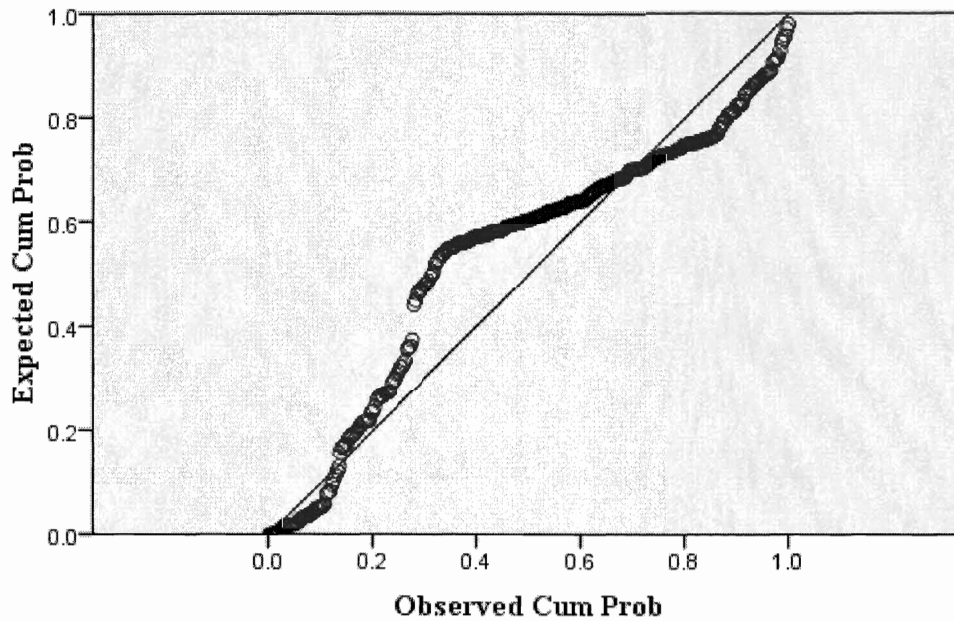
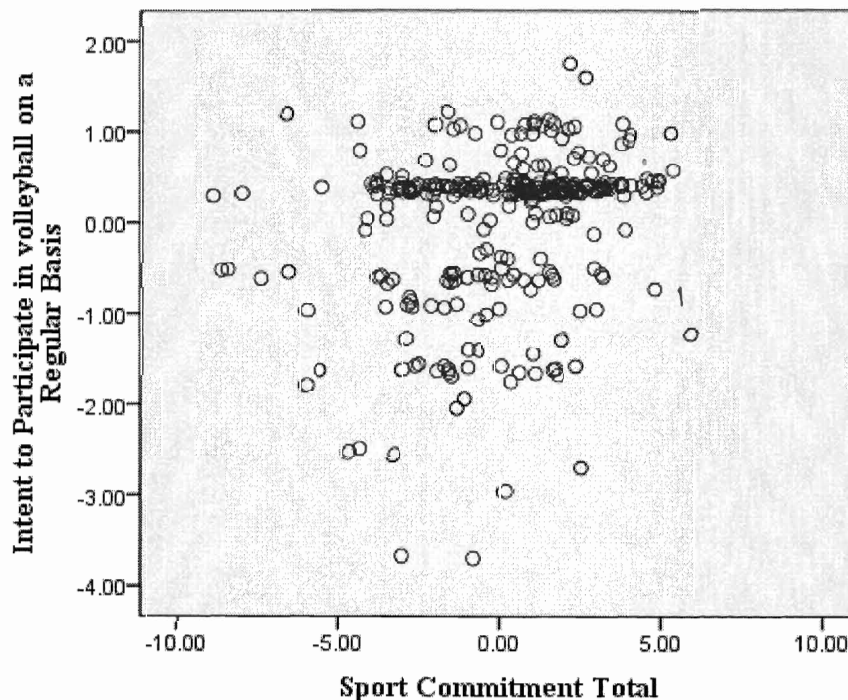
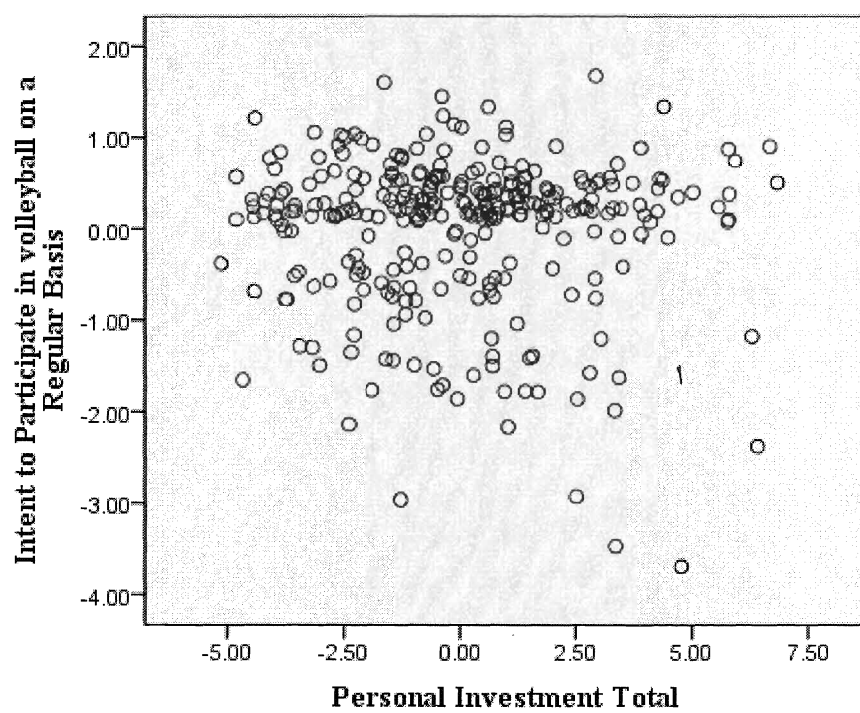
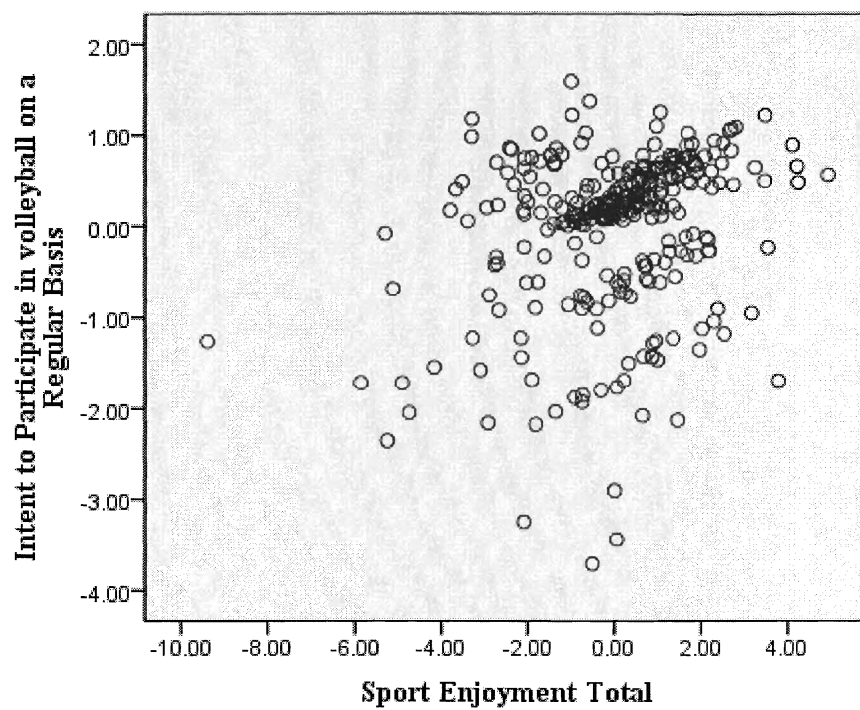
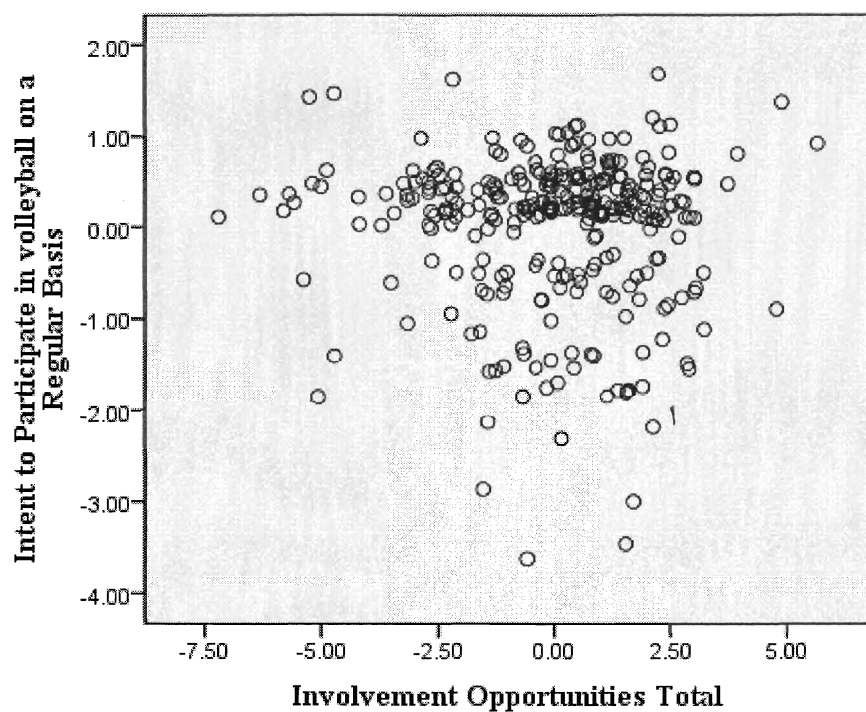
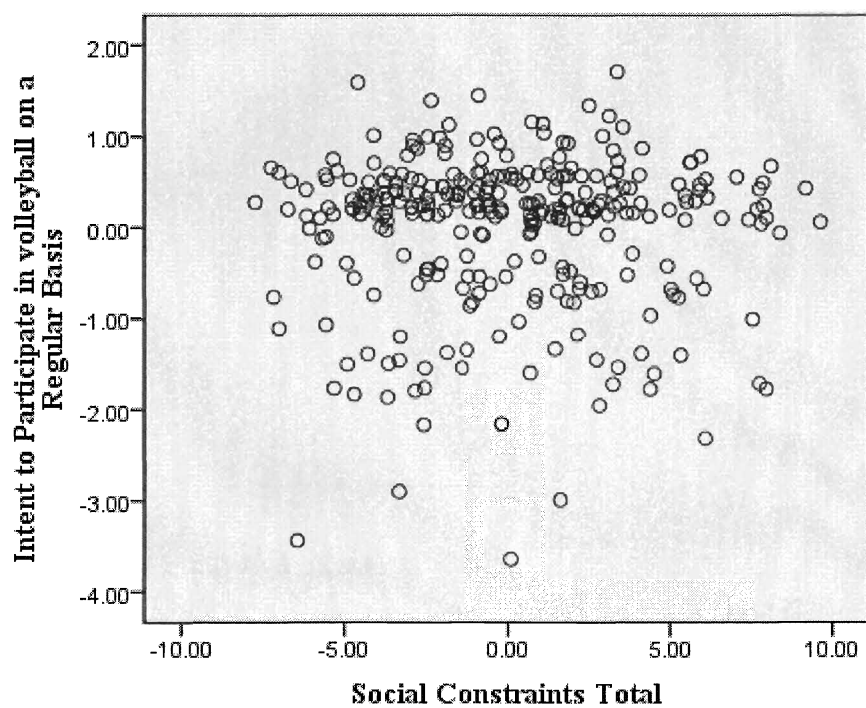


Table 5: The Assumption of Linearity (Scatter Plots) with the Sport Commitment constructs and the intent to continue participating in volleyball intramurals







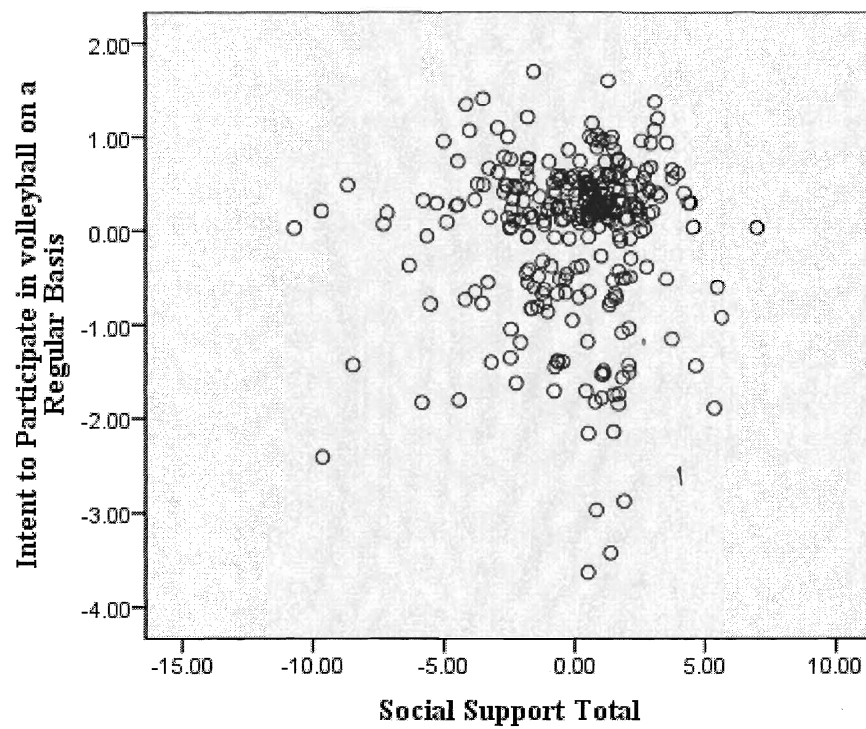
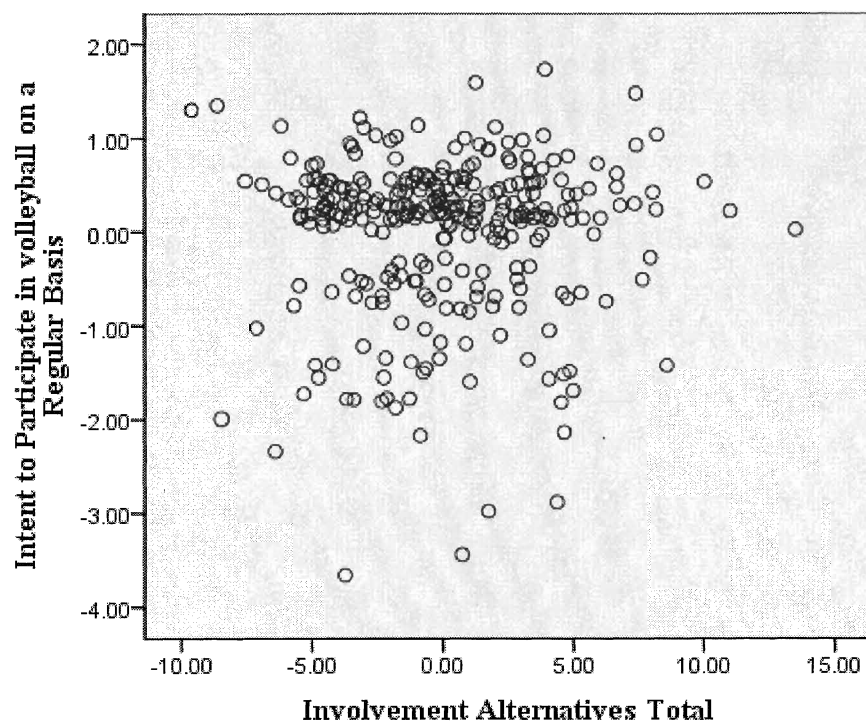
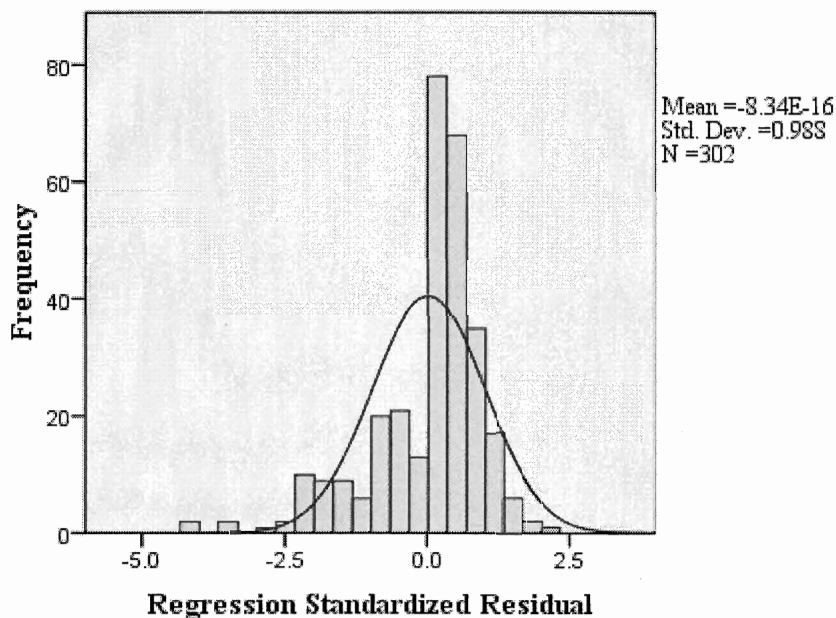


Table 6: The Assumption of Normality with the Sport Commitment constructs and the intent to continue participating in volleyball intramurals

Dependent Variable: Intent to Participate in volleyball on a Regular Basis



Research Objective 5 (ii.)

Table 7: The Assumption of Heteroscedasticity with the Sport Commitment Constructs and the intent to continue intramural participation and physical activity in the future

Dependent Variable: Intend to participate Intramurals & Physical Activity in the Future

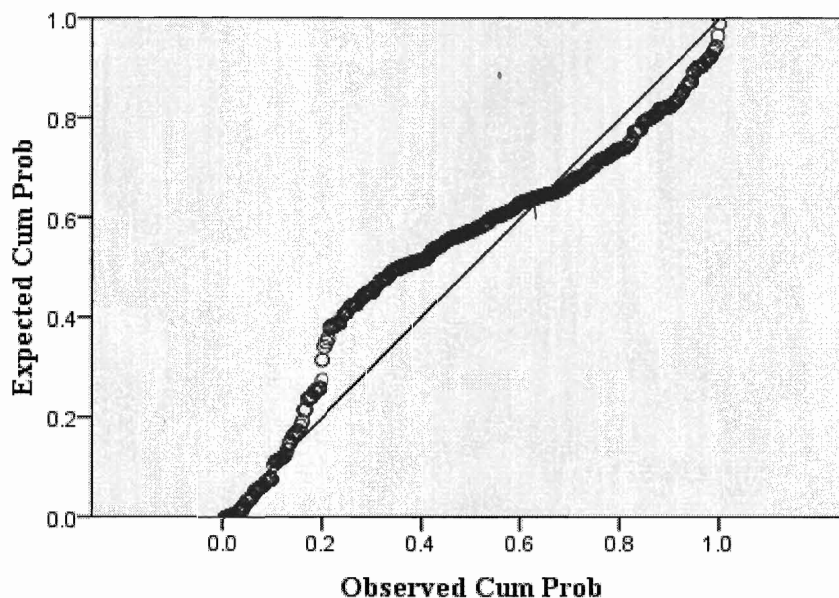
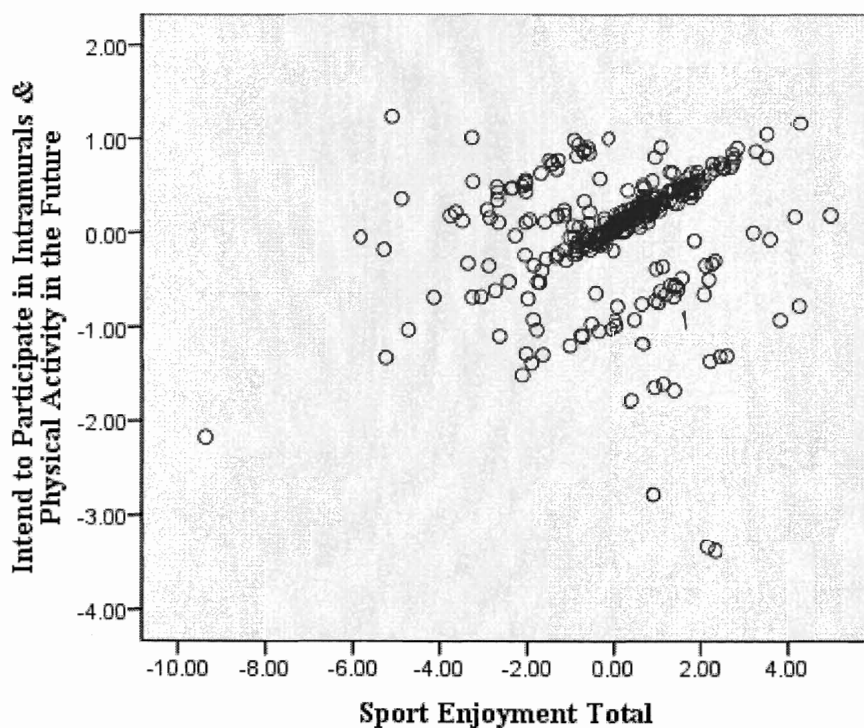
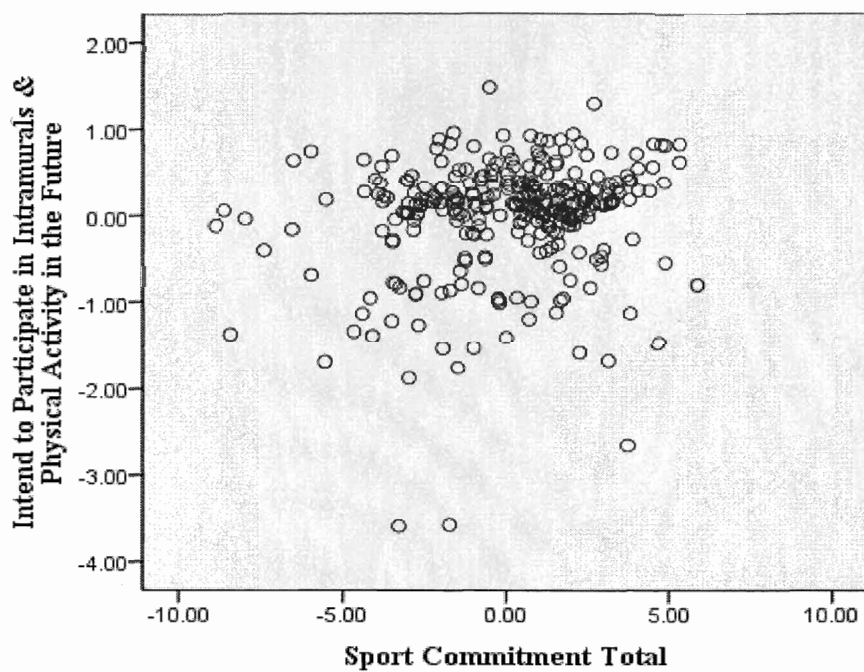
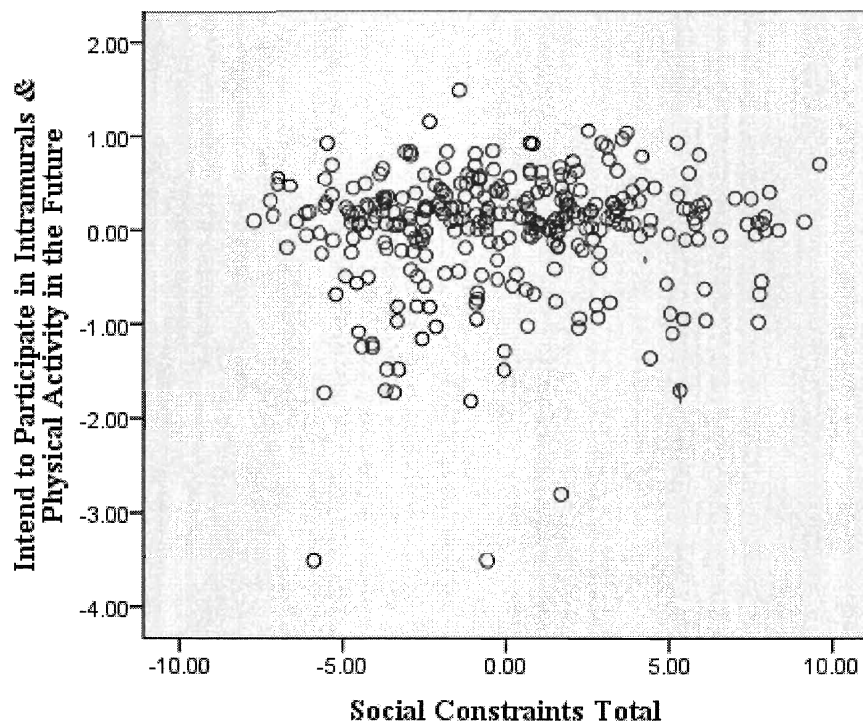
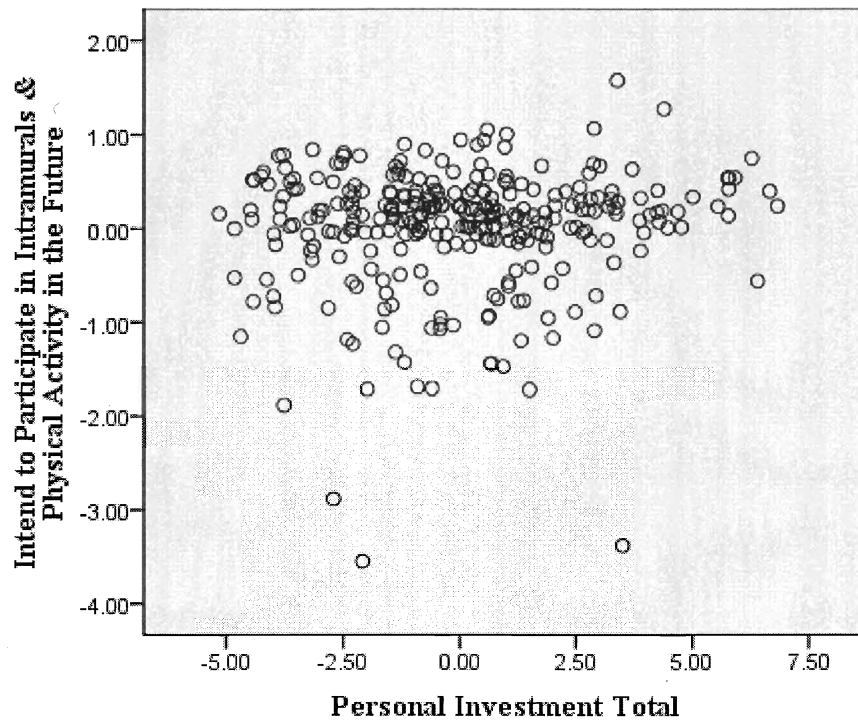
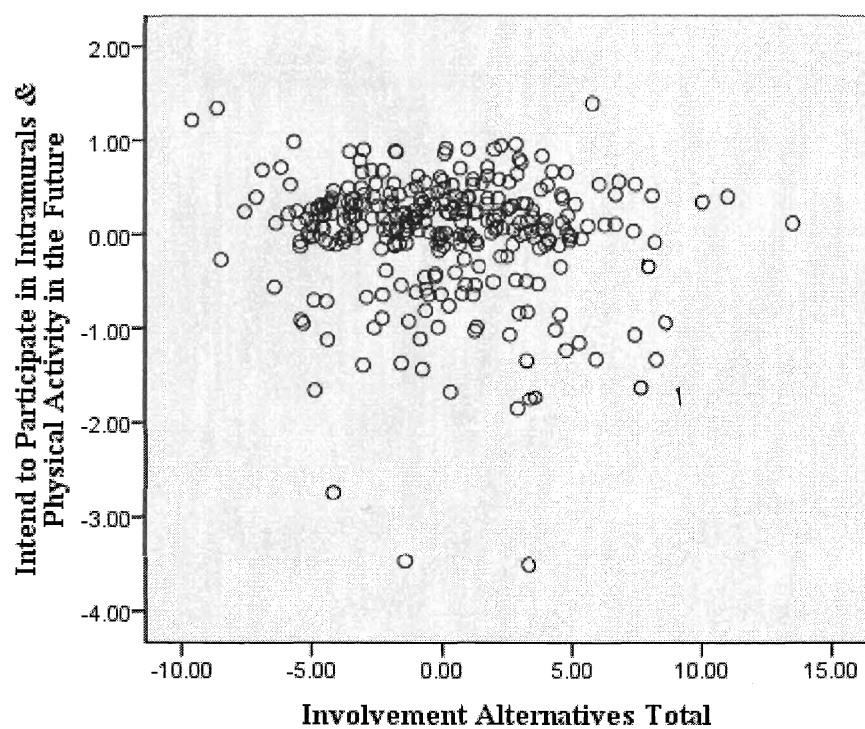
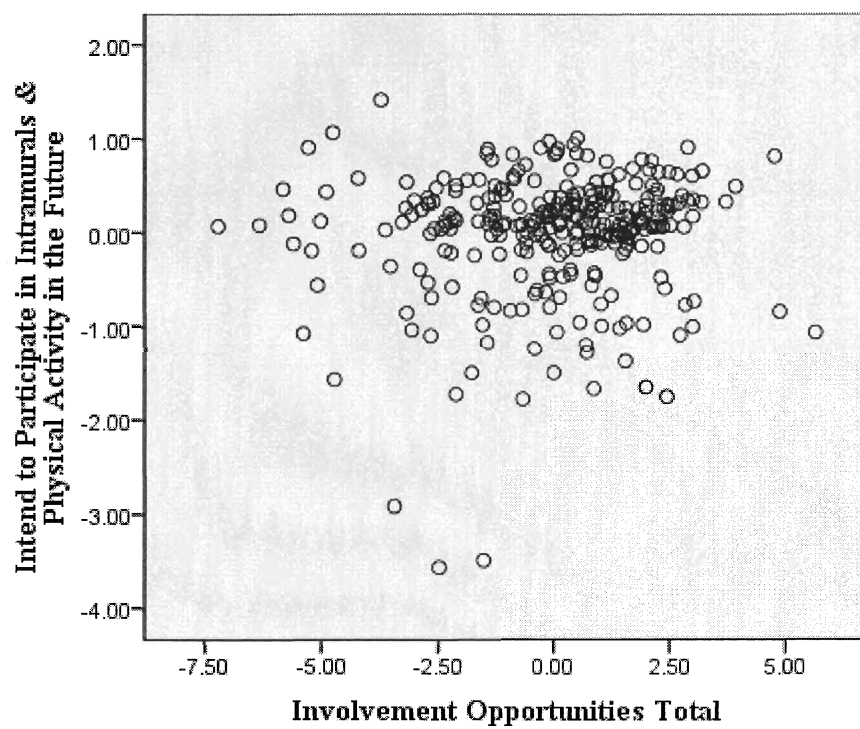


Table 8: The Assumption of Linearity (Scatter Plots) with the Sport Commitment Constructs and the intent to continue intramural participation and physical activity in the future







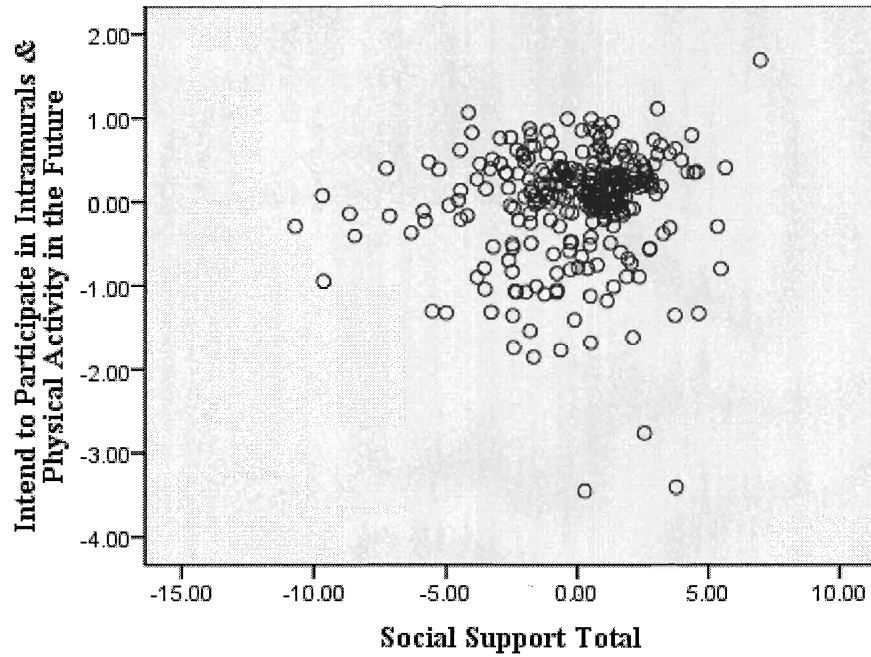
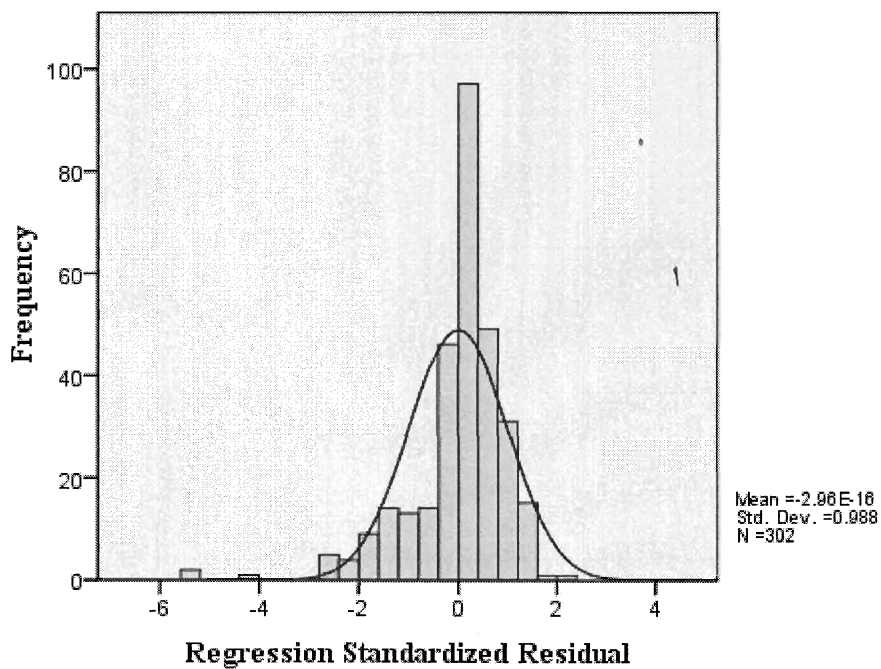


Table 9: The Assumption of Normality (Normal Distribution) with the Sport Commitment Constructs and the intent to continue intramural participation and physical activity in the future

Intend to Participate in Intramurals & Physical Activity in the Future



Research Objective 6 - Low Sport Commitment

Table 10: Assumption of Heteroscedasticity with Low Sport Commitment and The Theory of Planned Behaviour

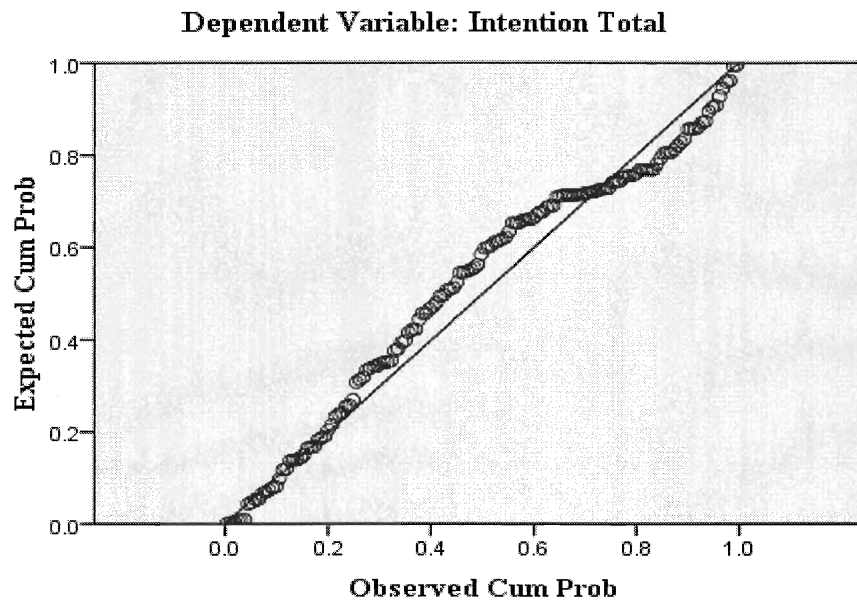
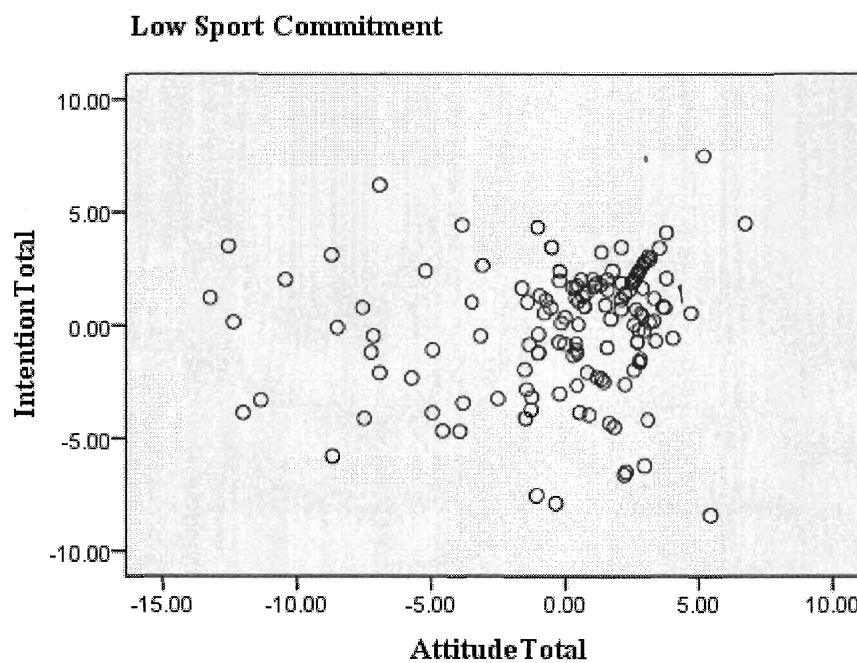


Table 11: The Assumption of Linearity with Low Sport Commitment and the Theory of Planned Behaviour



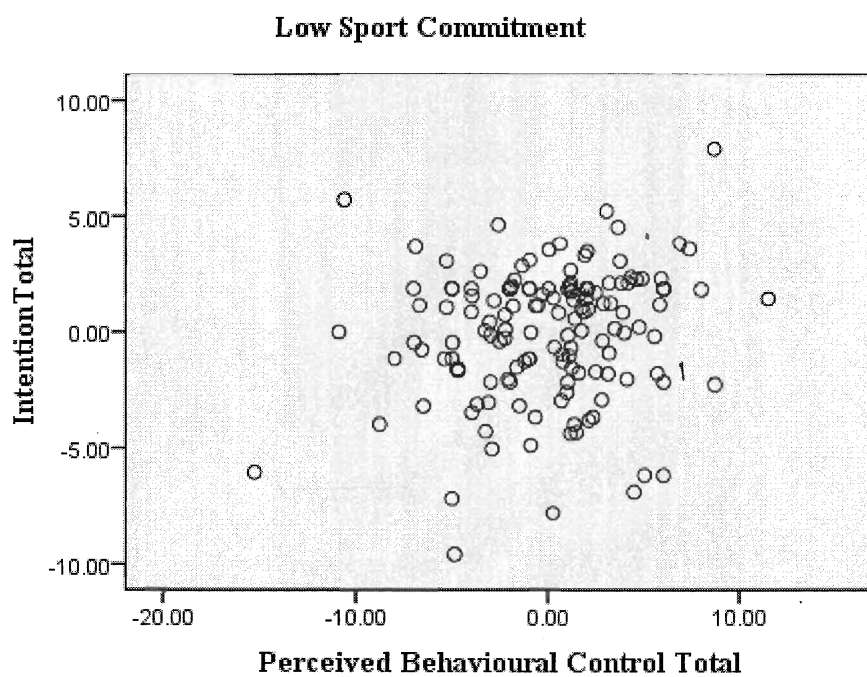
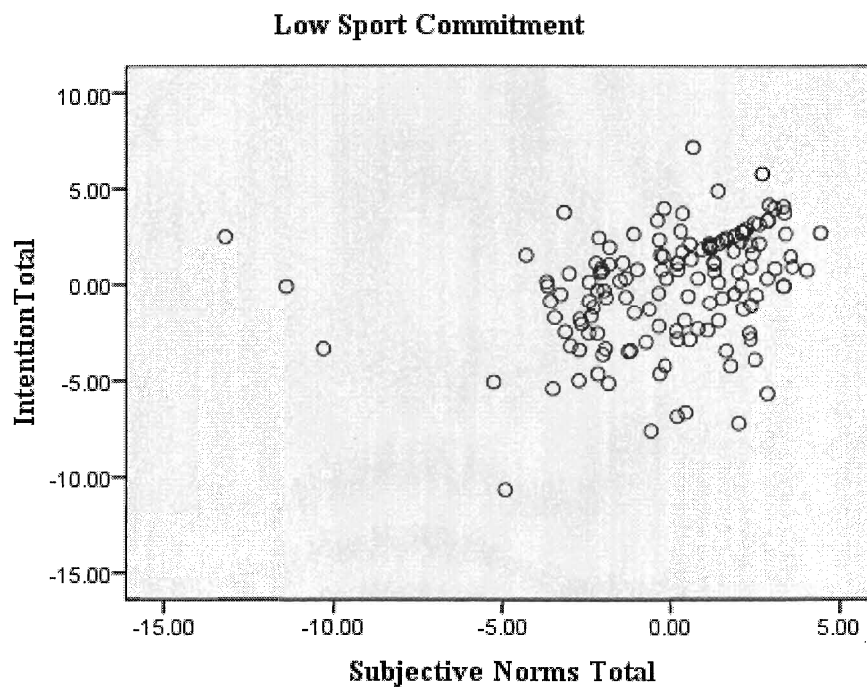
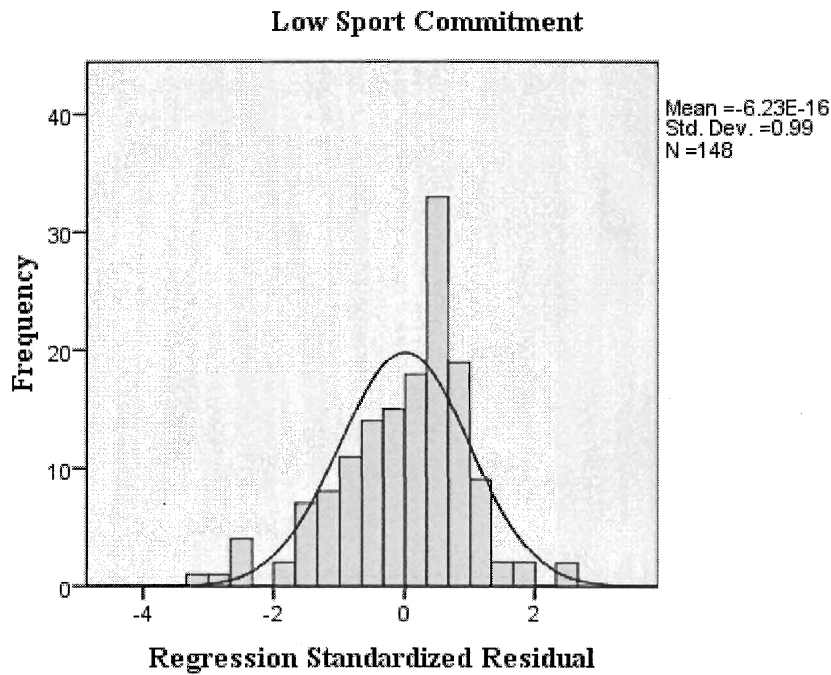


Table 12: The Assumption of Normality with Low Sport Commitment and the Theory of Planned Behaviour



Research Objective 6 – High Sport Commitment

Table 13: Assumption of Heteroscedasticity with High Sport Commitment and the Theory of Planned Behaviour

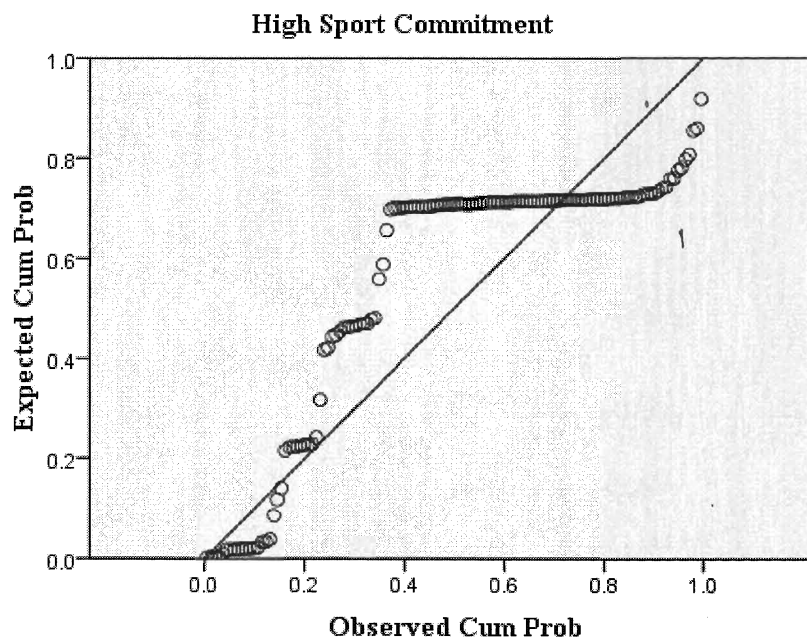
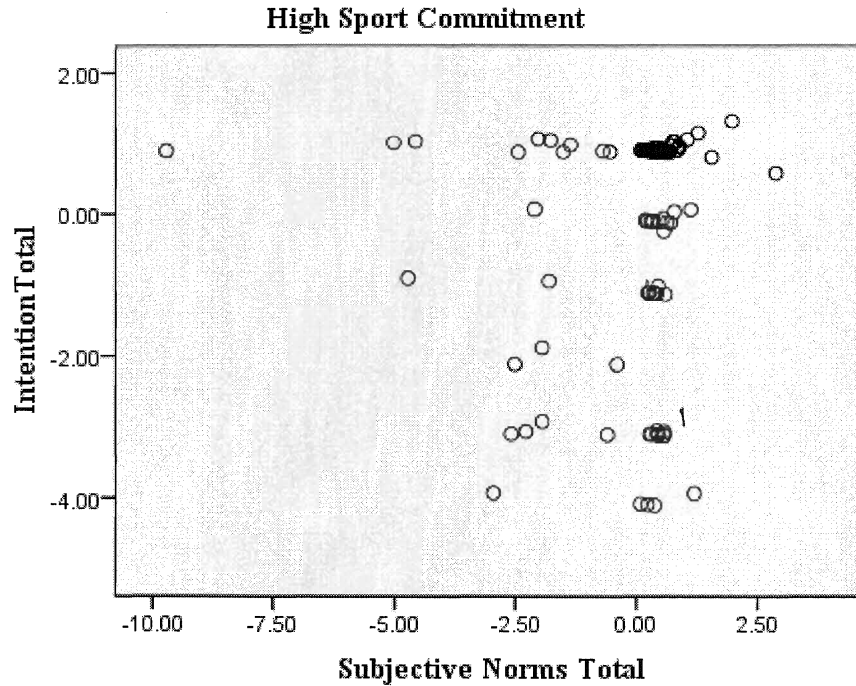
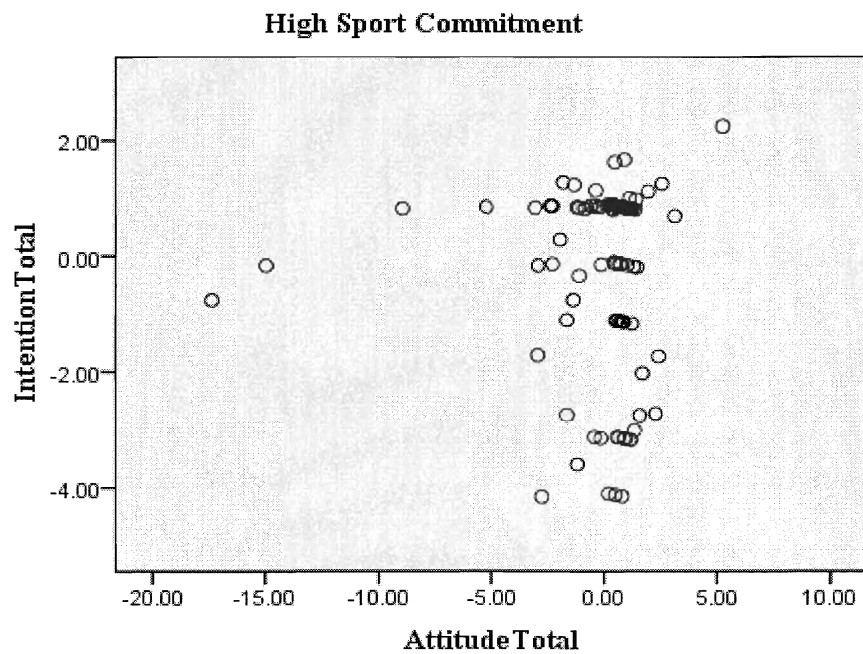


Table 14: The Assumption of Linearity with High Sport Commitment and the Theory of Planned Behaviour



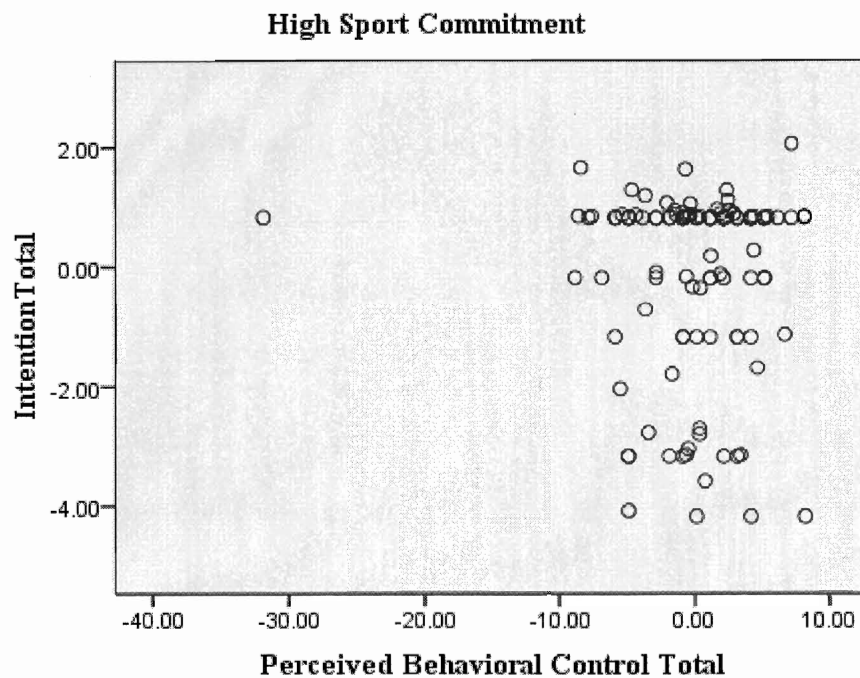
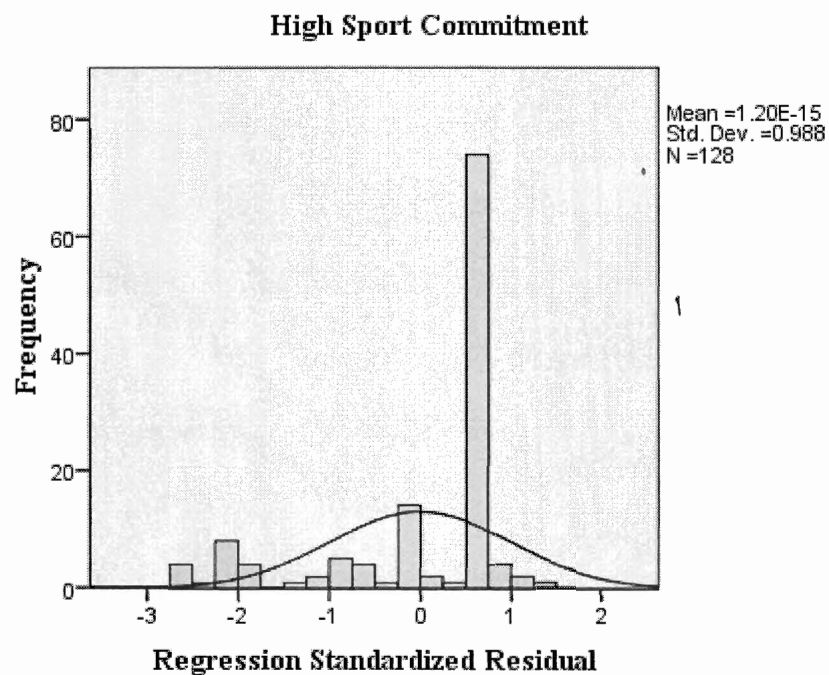


Table 15: The Assumption of Normality with High Sport Commitment and the Theory of Planned Behaviour



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